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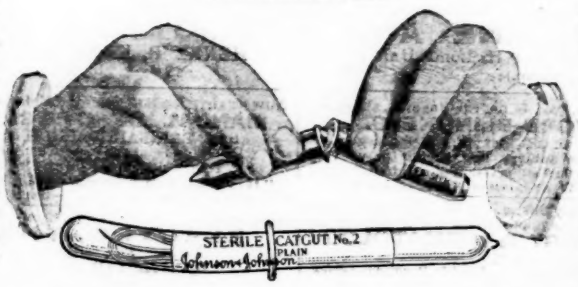

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THE

Milroy Lectures

ON

MEAT INSPECTION,

WITH SPECIAL REFERENCE TO THE DEVELOPMENTS OF RECENT YEARS.

Delivered before the Royal College of Physicians of London

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LECTURE II.[1]

THE PATHS OF INFECTION IN CATTLE.

MR. PRESIDENT AND GENTLEMEN,—The terms "localised" and "generalised" are used in meat inspection in connexion with the distribution of tuberculous lesions. They are, however, not entirely satisfactory, for if they are strictly interpreted they are not of sufficient significance and, on the other hand, if they are given an extended meaning confusion may result. I prefer to use the words primary and secondary lesions and assume that primary lesions are always found in situations which admit of infection having been received from outside the body—e.g., the lungs, mesenteric and cervical glands, the external genital organs, and local inoculations. The secondary lesions are extensions from the primary lesions, from which latter the infection is conveyed by way of (*a*) the various tracts of the body, such as the respiratory or digestive tract; (*b*) the lymphatic system; (*c*) the venous blood stream; and (*d*) the arterial blood stream. In arriving at a decision as to the action which should be taken in any particular case I endeavour to locate the primary lesion and to decide along which course the infection causing the secondary lesions has passed. It is not always possible to arrive at a definite decision, but in case of doubt the more serious of the alternatives is the one accepted.

In the bovine, the seat of the primary lesion varies with the age of the animal. In calves of four or five weeks old tuberculosis is not common, but it is by no means infrequent, and such cases as I have seen have been mostly of the congenital type. In these cases the primary lesion is to be sought in the maternal system and the secondary lesions are distributed to the calf by the maternal arterial blood. The cases which are not congenital among these very young animals are of the ingestion type, in which early lesions are found in the mesenteric glands and less frequently in the cervical glands or both. These cases also are not numerous. At a little older age, but with very few instances under ten weeks, the regular type of cattle, primary pulmonary, is met with, whilst at a still older age the primary ingestion cases diminish in numbers, and the pulmonary type is almost the only one observed.

The course of infection can be followed with certainty by observing the lesions in very young animals. These, with few exceptions, are not killed on account of illness, but in the course of preparation for human food, and thus early unsuspected cases come under observation.

CONGENITAL TUBERCULOSIS.

In the fœtal circulation the arterial blood passes mainly through the abdominal organs. Very little reaches the lungs, and that only at a later stage in the circulation. The obvious deduction is that in such circumstances blood charged with infection will mainly affect the liver, spleen, and kidney, and the lungs little, if at all. No primary lesion is observed, and all lesions are of the miliary type. In addition, the size of the lesions varies in groups, indicating different stages of growth due to release of infection at different times. As regards extent of infection, the mesenteric glands show no deposits, the greatest number of centres are in the liver, the kidneys show the fewest, and the spleen a number intermediate between the two. The kidneys sometimes escape so far as may be judged by careful macroscopic search. When slaughtered at the age of four weeks the largest lesions may be about a quarter of an inch or even more in diameter in the liver and spleen, but rather less in the kidney. There are often many minute spots observed in the liver which appear to suggest a very recent dissemination. These minute spots are not so easily seen on the spleen owing to the nature of the covering; they are seen in fewer numbers occasionally on the surface of the kidney. This later dissemination may have passed through the lungs into the arterial stream, as the lungs often show early centres of infection of the miliary type. These latter are small, many are subpleural, and in that situation are about an eighth of an inch in diameter, translucent, and obviously tubercles much younger in age than the earlier ones in the abdominal organs. Their origin appears to be due to lymph infection conveyed from the abdominal organs and the related lymphatic glands after birth. They reach the lung either by direct entrance into an eroded vein in the affected organ or lymph gland, or by infected lymph which reaches the blood stream by way of the main lymph tract. From the lungs the infection is carried in the arterial blood to the system generally. If the dose of infection has been severe, lesions will be found in the lymph glands of the carcass, most often the external inguinal and prescapular.

This represents the course of events in the congenital cases. If the calf is not slaughtered till a later age, all the lesions develop and auto-infection may set up lesions in the mesenteric and perhaps cervical glands, and so a stage arrives when it becomes impossible to differentiate the case with certainty from one of primary intestinal origin with later dissemination. (This would not really matter to the meat inspector as regards his decision, since the distribution would be sufficient to require condemnation.)

ACQUIRED TUBERCULOSIS.

In calves up to the age of 10 weeks the abdominal type, although not common, is more frequently observed than the pulmonary. This observation does not agree with the experience of Chaussé. The primary lesion is more generally found in the mesenteric glands than the cervical. Sometimes a double infection is noted.

Abdominal Type.

The mesenteric glands may be affected alone, but the liver soon shows miliary lesions and the portal gland becomes affected. The infection is conveyed to the liver by radicles of the portal vein. Further development results in miliary deposits in the lungs conveyed by the venous blood stream in the manner already described. The next advance is infection of the arterial stream by way of the lungs, resulting in secondary deposits in liver, kidneys, and systemic lymph glands, and perhaps spleen. All or only some of these may show lesions.

Cervical Type.

The cervical glands may show infection alone. Later, miliary tubercles may be found in the lungs due again to venous blood infection. Subsequent development follows infection of the arterial blood stream with results as in the last example.

Double Primary Infection of Cervical and Mesenteric Glands.

In this instance the only difficulty is the decision whether the liver lesions are due in part to secondary infection by way of the arterial blood, or whether they entirely arise from infection conveyed by the portal system. If from the arterial system, lesions indicating at least two different ages may be observed, and the fact is rendered decisive if lesions are in addition found in the kidney, systemic lymphatic glands, or spleen.

Pulmonary Primary Lesions.

This is by far the most common form of invasion of cattle by tuberculosis. The development of the disease is easily followed. The lungs may show a primary lesion without macroscopic evidence of tubercle in any other organs, but extension soon occurs and the following possibilities are to be noted: 1. Extension of the disease by the lymphatic tract to the glands in the mediastinum. 2. Auto-infection by swallowing infected sputum which may give rise to lesions in the mesenteric glands, or in one or other of the cervical glands. 3. Infection of the arterial blood stream by way of the pulmonary artery and the left side of the heart. 4. Extension of the primary lesion by the development of tubercles around the periphery of the primary lesion. There may be more than one primary lesion observed in the

[1] Lecture I. was published in THE LANCET of August 4th, 1917, p. 147.

lungs. A few observations are desirable respecting these groups.

1. *Development by the lymphatic system*,—One or more of the mediastinal and bronchial glands soon become infected from the lungs, and they at a later stage may infect the venous blood stream in the manner already stated. In this manner the lungs become infected secondarily with miliary tubercles in addition to their being the seat of the primary lesion.

The bronchial and mediastinal glands appear to have a direct relationship with the pleural cavity. Possibly this space is lubricated with lymph supplied by these glands and they may likewise drain off excess. If that be the case it would account for the frequency of tuberculosis of the pleura which is often seen in considerable amount in relatively early cases of tuberculosis. The remarkable extent of infection in the pleura is probably the result of friction since the lubricating medium in an infected state is passed backwards and forwards over the pleural surface. It is interesting to note that pleural tuberculosis is a late manifestation in pigs, which is what one expect seeing that the origin in pigs is generally due to ingestion. The comparative line of development in the bovine and porcine is—

Ox.		*Pig.*	
Lungs (primary).		Cervical or mesenteric gland (primary)	
Mediastinal glands.	Lymphatic extension.	Lungs (miliary) extension by the blood stream.	
Pleura.		Mediastinal glands.	Lymphatic extension via the lungs generally, but infection may have been conveyed by the blood stream.
		Pleura.	

In the ox the disease has frequently not extended by the blood stream at the time of pleural attack, but in the pig it has; thus the lung affection following cervical infection would be of the miliary type, and so probably tuberculosis of the type disseminated by the arterial blood stream would be developing at the same time as the pleural lesion. Pleural lesions in the pig in cases not of primary pulmonary origin are, therefore, nearly always associated with dissemination.

The extension from the pleura is to the subdorsal and suprasternal lymph glands with possible future increase of infected material passed into the venous blood channel and so increasing the lung affection.

(2) *Auto-infection from the lungs* would result in development of either mesenteric or cervical lesions with subsequent development as already suggested. In this connexion it is only necessary to state that, as in the case of the pleura and the mediastinal glands, the peritoneal cavity appears to be related to the mesenteric glands, and infection of the cavity may follow infection of these glands, and the extraordinary development of the disease may likewise also be due to friction.

(3) and (4) *Development by way of the arterial system, and extension of tubercles round the primary lesion.*—The tendency of tuberculosis in cattle is towards the establishment of a chronic condition rather than an acute. This shows itself in the formation of a fibrous tissue delimiting membrane around the primary lesion and degenerative processes in the material enclosed, which often becomes caseous and calcified. This enclosing tissue would appear to prevent much extension by way of the arterial system from the average primary lesion. Occasionally there must be an escape, but not always enough to set up a lesion in other organs, though at times even this happens, but dissemination in such cases would generally be slight in amount. On the other hand, tubercles may develop as a result of infective particles from other centres forming emboli in the lung capillaries. There is more probability of escape of infection into the arterial blood-supply at the time the emboli form in the lung than during the later growth of the tuberculous foci, and therefore miliary tubercles in the lungs are more likely to be associated with dissemination by the arterial system than are primary centres. Primary centres, however, may take on more acute development and tubercles may develop at the periphery. The risk of dissemination in such cases is probably equal to that of the growing embolic centres but less than results from the original release of infection which gave rise to miliary lesions. The risk, however, is greater than is observed in the chronic type of primary lesion. Miliary tuberculosis of the lungs is therefore the condition which most frequently renders a whole carcass unfit for human consumption; acute primary lesions with evidence of recent active growth are next in importance, and chronic primary lesions of least importance.

It does not always follow that the dose of infection which sets up miliary tuberculosis in the lungs is sufficient also to set up lesions in the organs beyond. There is some general relationship between the extent of pulmonary deposit and probability of deposit in other organs. If the animal lives for some time after the infection has escaped into the blood stream, growth of the lesions in both lungs and organs will continue, and at the inspection the probability of simultaneous infection can be ascertained. From the meat inspection point of view, therefore, account requires to be taken of the age of the miliary deposit in the lungs, and the extent. Early deposits must be regarded as dangerous, whilst in older cases the actual location of the lesions becomes a more decisive factor. In recent cases, if the lesions are limited to one organ beyond the lungs there seems to be very little risk in passing the carcass, and if two organs are involved but the deposits are old and not numerous the same deduction appears to me to be justifiable. In cases where doubt arises an examination of the glands of the carcass assists in the decision.

The organs affected by the arterial blood stream are the liver (not forgetting the possibility of portal infection), the spleen, the kidneys, the internal genital organs, the bones, joints, and muscles. The glands which may be affected in arterial extension are mainly the prescapular, the precrural, the external inguinal or supra-mammary, the popliteal, and probably the ischiatic (this is never examined). Although infection of these lymphatic glands is generally indicative of arterial dissemination, the possibility of inoculation tuberculosis should not be overlooked. In these cases infection of the gland may arise by way of the lymph stream, and the position is that of a localised infection. Instances of this are not frequent in meat inspection work.

CONSIDERATION OF THE RECOMMENDATIONS OF THE ROYAL COMMISSION RESPECTING THE CONDEMNATION OF TUBERCULOUS CARCASSES.

The recommendations of the Royal Commission so far as they relate to tuberculosis observed in the carcasses of cattle may be considered in detail at this point.

The Entire Carcass and all the Organs may be Seized.

1. *When there is miliary tuberculosis of both lungs.*—Miliary tuberculosis does not arise as a primary manifestation, nor does miliary tuberculosis, except on rare occasions, affect one lung only. It is an incident in the development of a primary lesion which has formed in one of the positions already stated. The new tubercles around an actively growing primary lesion in the lungs are not embolic in origin, and therefore do not give rise to the same risk of dissemination by the arterial blood stream, as do lesions of the embolic type. Miliary tuberculosis of the lungs results from infection of the venous blood stream, and is the most serious lesion in tuberculous carcasses, but for reasons stated this recommendation seems too exacting, as I believe some carcasses so affected may be saved.

2. *When tuberculous lesions are present on both the pleura and peritoneum.*—Lesions so situate are no proof that the infection has either been conveyed by the arterial or venous blood-supplies. They may, in my opinion, be entirely lymphatic in origin, as already described. In general the rule as it stands is sound, owing to the extensive character of the lesions making it impossible to remove the affected tissue, to the consequent effect on the system generally, and to the probability of many lymph glands being implicated, rendering complete investigation a matter of considerable difficulty. Nothing, however, is said in the recommendations respecting affections of one or other serous surface separately. They are, in my experience, not affected without other associated lesions—that is, the pleura without one or more of the lymphatic glands in the mediastinal space and the peritoneum without an associated lesion in the mesenteric glands. Probably one serous surface may also be affected by the other by directly intercommunicating lymph channels on the diaphragm, or the pleura from the peritoneum by the roundabout way of the posterior mediastinal gland which receives lymph from some part of the upper surface of the liver.

In the case of affections of the pleura, I am of opinion that total destruction of the forequarter is not necessary in every case. Provided the lesion on the parietal pleura is single, of limited extent, say not more than the size of the

palm of the hand in area, and the subdorsal and suprasternal glands show no signs of infection, I think it would suffice to remove the part of the chest wall on which the lesion is located together with a fair margin extending beyond; in addition the remaining parietal pleura should be stripped, but this should only be done under the immediate supervision of an inspector. In those cases where the lesions are multiple and extensive and the glands affected, the whole affected forequarter should be condemned. In the case of the peritoneum a similar limited localisation should be dealt with by wide removal of that part of the abdominal wall which is affected. In more extended cases condemnation of the hindquarters is called for. In either of these instances if there is evidence of extension by the arterial blood stream as shown by affection of certain lymph glands, the whole carcass should be condemned. The lungs and associated glands should invariably be condemned if the pleura is affected, and the intestines and mesentery in the case of the peritoneum.

3. *When tuberculous lesions are present in the muscular system or in the lymphatic glands embedded in or between the muscle.*—The obvious intention here is to prevent the sale of meat which has been affected by the arterial blood stream. Lesions of the muscular tissue are rare. It is generally assumed that the lymph removes whatever infection may reach the muscle, and that the glands draining these areas will develop the tuberculous lesion. A lesion in the muscular tissue, excluding the rare condition of direct extension from a lesion in some other tissue, indicates infection by the arterial blood-supply; similar significance attaches to lesions of bones, joints, and sexual organs, and also infection of the spleen and kidney.

It would be better definitely to state the glands the affection of which is regarded as being of sufficient importance to justify condemnation of a whole carcass. The term "embedded" in or between muscles is not precise. It might be argued with some show of reason that some of the cervical, prepectoral, suprasternal, subdorsal, and certain glands of the hindquarter are embedded in muscle, but the significance of their being affected is not so great as to justify total condemnation. The glands having the importance which is suggested should be limited to those already enumerated.

4. *When tuberculous lesions exist in any part of an emaciated carcass.*—This recommendation is obviously sound. Emaciation always calls for condemnation whatever the disease which gives rise to the emaciation.

No reference is made in the regulations to the requirement of condemnation in cases of associated infection of septic origin. This condition is more generally found in connexion with primary lesions, and the chief point for consideration is size, in association with acuteness of symptoms, both local and general. In acute cases insufficient deliminating membrane may exist which allows of extensive absorption; this gives rise to feverish symptoms or those of toxæmia, evidence of which is found in colour and smell and setting of the meat, and possibly in the lymphatic glands. These cases are considered from the ordinary standpoint of septic infection, with the additional factor that it is superimposed on a tuberculous lesion.

The Carcass, if otherwise Healthy, shall not be Condemned, but every Part of it containing Tuberculous Lesions shall be Seized.

1. *When the lesions are confined to the lungs and lymphatic glands.*—No exception can be taken to this recommendation. It is only necessary to remember that when miliary lesions have become associated with the primary lesion condemnation of the whole carcass may become necessary, but this is provided for by a separate recommendation. Certain acute primary lesions and complications, such as large abscesses, may call for condemnation of carcasses.

2. *When the lesions are confined to the liver.*—They are practically never confined to the liver,[2] the portal gland is soon affected and the mesenteric glands are usually infected in cases where the arterial blood supply has not conveyed the infection. In this latter instance the lungs would generally show infection and thus transfer the case to another group. If the glands as suggested are included, the advice would be acceptable.

[2] This sentence is qualified because of the possibility of infection reaching the liver by means of a vein in the intestinal mucosa.

3. *When the lesions are confined to the pharyngeal gland.*—It is not a very infrequent occurrence for bovine animals to show tuberculous lesions alone in these glands and when affected they are generally evidence of infection by feeding and in young stock. In these instances condemnation of the parts drained by such glands would meet the case.

4. *When the lesions are confined to any combination of the foregoing but relatively small in amount.*—The combinations are as follows:—

(*a*) Tuberculosis of the pharyngeal glands with pulmonary lesions. These latter may be primary or secondary. If primary the recommendation is sound, but if secondary the lung lesions will be of the miliary type, and the case thus transferred to another group for decision. Additional combinations occur later according to the distribution by the arterial system.

(*b*) A primary lesion in the lungs with embolic foci in the liver. In this case the primary lesion in the lungs may be of the chronic type and the liver lesions single or few, in which case the rule would be sound. On the other hand, the lung lesion may be acute, which would require greater significance to be paid to liver lesions and indicate the necessity for careful decision. If the primary lesion was such as to suggest that escapes of infection into the arterial stream might be frequent, condemnation would be necessary.

(*c*) Embolic foci in the liver (regarded as an extension from a primary lesion in the mesenteric glands) with secondary deposits in the lungs. These latter would transfer the case to the miliary group for classification.

(*d*) Lesions in the mesenteric glands and liver, together with lesions in the pharyngeal glands—an unusual combination as a primary condition. If there is extension to the lungs either from the abdominal or cervical lesions the classification would again be that of miliary tuberculosis, but with lungs free the recommendation is acceptable, as there would be no evidence of infection having passed the lungs.

SUGGESTED COURSE OF ACTION WHICH SHOULD BE TAKEN IN CASES OF BOVINE TUBERCULOSIS.

Congenital Tuberculosis.

The carcasses of calves showing congenital lesions should be condemned together with all organs.

Note.—Congenital cases may not be recognisable as such if the animals are several months old when slaughtered owing to the considerable development of secondary lesions which makes it impossible to decide which are the earliest lesions. The distribution of the lesions in such cases would call for condemnation even if the origin were not congenital.

In early cases of congenital tuberculosis the lesions in the liver, spleen, and kidneys are easily recognised as being older than those in the lungs or the mesenteric glands or the systemic glands. They are also generally of more than one stage of development, and the pulmonary lesions are always of the secondary and miliary type.

Acquired Tuberculosis.

The seat of the original primary lesion or lesions should be ascertained if possible. If this cannot be done a decision will require to be made based on the distribution of existing lesions.

1. When the primary lesion is in the lungs, condemn the lungs and the associated lymph glands.

(*a*) If there is extension of the infection to the cervical glands, condemn the head and neck. Examine the prepectoral glands and remove them whether tuberculous or not.

(i) If there has resulted secondary extension to the lungs in the form of miliary tuberculosis condemn the whole carcass if the deposit is considerable.

If the deposit is of lesser degree, examine the liver, spleen, and kidneys and their associated lymph glands, and if recent deposits are noted in any two of these organs or their lymph glands, condemn the carcass.

If deposits exist in only one of these organs, or if in two they are not of recent development as shown by size and fibrous encapsulation, examine the prescapular, precrural, external inguinal or supra-mammary and popliteal lymph glands, and if any one or more of these glands is affected condemn the whole carcass. Only affected organs and glands need be condemned in other cases.

(*b*) If the primary pulmonary lesion or lesions are of an acute character as shown by the development of

tubercles around the original sites of infection together with a minimum amount of fibrous tissue, regard the case as equivalent to miliary tuberculosis and deal with the carcass as in 1 (*a*) (i).

(*c*) If the lesions (generally primary) are complicated by septic processes the effect of this on the meat should be considered, and a more serious view of the condition should be taken than when a septic process exists apart from a tuberculous affection.

2. When the primary lesion exists in the mesenteric glands, condemn the mesentery and the intestines and also the liver and portal glands, whether these organs show macroscopic lesions or not.

(*a*) If the disease has extended to the lungs in the form of miliary deposits, deal with the carcass as set out in 1 (*a*) (i). As a measure of additional safety in these cases regard the liver as having been infected by the arterial blood stream from the lungs if tubercles of two or more different ages are observed in that organ.

3. In cases of double infection, such as a primary lesion in the lungs and infection of the mesenteric glands (generally resulting from auto-infection), condemn the lungs and associated glands, the mesentery, and the liver and portal glands.

At a later stage when miliary tubercles in the lungs are in evidence deal with the carcass as in 2 (*a*).

Note.—Owing to the fact that the centres of infection are increased in these cases, miliary deposits are more likely to follow in succession, and therefore it is necessary to ensure that recent deposits are not overlooked. In cases of doubt the decision should be in favour of condemnation.

4. In a case of primary lung infection with secondary extensions to both the cervical and mesenteric glands, deal with the carcass as though three separate foci existed. Condemnation of the whole carcass requires consideration if the animal is emaciated or if miliary tubercles have also formed in the lung, in which connexion observe the note in paragraph 3.

5. Inoculation lesions should be regarded as primary lesions until proof of extension by the venous blood stream exists, as shown by miliary deposits in the lung. When this stage is reached deal with the carcass as set out in 1 (*a*) (i).

6. Tuberculous carcasses should be wholly condemned if emaciated, or if the animals are slaughtered whilst in a condition of fever.

7. If tuberculosis of the pleura exists, provided the lesion on the parietal pleura is single, of reasonably limited extent, and the subdorsal and suprasternal glands show no signs of infection, the part of the chest wall bearing the lesion may be removed and the rest of the joint passed for human consumption. It would be an additional precaution to strip the pleura from the rest of the affected chest wall, but this should be done only under the supervision of an inspector. Stripping of the pleura should not be allowed except under supervision. When the lesions are multiple and extensive and the glands are affected the whole forequarter should be condemned. More extensive lesions may be permitted on the visceral pleura than on the parietal without requiring condemnation of the forequarter.

8. If tuberculosis of the peritoneum is present the part of the flank on which it is placed should be cut away and condemned, allowing a fair margin for safety. The abdominal contents should also be condemned. The lumbar glands should be then examined. If these are free from infection the carcass may then be passed after removal of the affected part, but if they are affected the hindquarter should be condemned.

9. Tuberculosis of both pleura and peritoneum combined should be dealt with as though the lesion on each serous surface were being considered separately. There does not appear to be sufficient reason to condemn the carcass simply because there is slight double infection. Slight lesions in each cavity should be dealt with as in paragraphs 7 and 8.

PREVALENCE OF TUBERCULOSIS IN PIGS.

An accurate comprehension of the frequency of tuberculosis in pigs can hardly be gained from slaughter-house statistics, since variations in the amount of inspection result in pigs in doubtful health being sent to areas where inspection is poorly carried out, and only those supposed to be free from defect being slaughtered where the supervision is most active. Variations may arise in districts, which although widely separated carry out equal supervision, and these depend upon the existence of local circumstances which predispose to the condition in pigs. For example, pigs from dairying counties which are fed on milk residuals will show a greater percentage of tuberculosis than those from districts where dairying is not a feature. For these reasons the returns of the Board of Agriculture,[3] which refer to investigations conducted in different parts of the country, are particularly instructive.

In the report of the Chief Veterinary Officer for 1914 details are given respecting pigs which were found to be tuberculous at the time of examination, and which were slaughtered as part of the procedure in swine fever investigations. Out of 8632 pigs of all ages so slaughtered 989 were found to be tuberculous. This represents a percentage of 11·5, and is undoubtedly a surprisingly high total, but, fortunately, it cannot be regarded as representing the average. It often happens that an owner possesses a herd which includes many thriftless and ailing animals, and he may consider that the herd is affected with swine fever. He notifies the Board, but investigation, with post-mortem examination, shows the condition to be tuberculosis. This fact would materially increase the percentage of tuberculous-infected pigs among those examined by the Board. On the other hand, the percentage observed in slaughter-houses is probably too low owing to the animals being selected if they are taken to a district to be slaughtered where interest in the work is sufficiently keen to result in statistical tables being prepared. The percentage on the Board's figures amounts to 11, and the average for Birmingham, Glasgow, and Brighton is about 3; the percentage for the country as a whole is therefore below 11 and above 3; probably 5 per cent. would not be far wide of the mark.

It is a matter of additional interest to note that, as in the case of cattle, the risk of infection increases with age and varies from 3·2 per cent. in unweaned pigs to 19·6 in boars. Doubtless a large proportion of the earlier infection results from maternal transmission, and the later increases follow infection from feeding on tuberculous offal either of animals or poultry. The actual figures are as follows (Table V.):—

TABLE V.

Description.	No. of pigs examined.	Number affected.	Percentage affected.
Unweaned	1395	47	3·2
Fatting	1841	178	8·8
Stores	4401	594	11·9
Sows	913	150	14·1
Boars	92	20	19·6

As stated, the percentage of infection is much higher than that reported from either English or foreign slaughter-houses, a series of which is shown in Table VI.:—

TABLE VI.

District.	Date of information.	Percentage affected with tuberculosis.	Authority.
Brighton	1914	2·73	Eastwood and Griffiths
Birmingham ...	1914	2·7	Veterinary Inspector.
Glasgow	1914	5·6	,, ,,
Versailles* ...	1913	0·4	P. Chaussé.
Brussels*	1912	0·28	Veterinary Fally.
Luxembourg* ...	1912	0·97	,, Spartz.
Copenhagen* ...	1911	4·69	,, Rasmuessen
Denmark†	1911	4·48	—
Budapest*	1912	1·63	,, Brenn.
Norvare* (Italy)	1911	1·0	,, Genotte.

* La Tuberculose du Porc, par P. Chaussé.
† Hygiène de la Viande et du Lait, 1913.

Of 368,428 Dutch pigs slaughtered for export to London, 5516, or 1·5 per cent., were found to be tuberculous.

The variations shown in the different districts and countries are the result of several factors, not the least important being the manner of feeding already referred to. It will be noted that in Copenhagen and in Denmark as a whole, where there is considerable dairying work, there are higher rates than in other districts. Mohler and Washburn[4] have also drawn attention to the same fact. They report that of

[3] Annual Report of the Chief Veterinary Officer of the Board of Agriculture for 1914 (Cd. 8043).

[4] Tuberculosis of Hogs, by J. R. Mohler and H. J. Washburn, United States Department of Agriculture.

325,000 pigs slaughtered in Forth Worth, Texas, where the animals are raised on alfalfa supplemented with grain, only 51 or 0·016 per cent. were condemned as unfit for food, as compared with 3·1 per cent., 3·4 per cent., and 6·4 per cent. respectively, condemned in the same period in three cities in one of the leading dairy States.

Differences between Bovine and Porcine Tuberculosis.

There are several important points of difference in the behaviour of tuberculous infection in the pig and the ox. Primary inhalation tuberculosis is the more common method of infection in the ox, intestinal lesions in the form of tuberculosis of the mesentery or cervical glands being often the result of auto-infection or of dissemination. Primary intestinal infection is uncommon apart from the congenital cases and the few cases in calves which follow the ingestion of infected food. On the contrary, the intestinal type is the common affection of pigs sent for slaughter to provide human food. For this purpose they are mostly slaughtered when less than 8 months old. The different habits of the two animals account partly for the different modes of infection. The calf is a vegetable feeder when it leaves its mother, but pigs feed on animal matter from an early age.

The weak spots in the digestive tract are asserted by Chaussé [5] to be the tonsils in the upper part and Peyer's patches and the solitary glands in the intestines. The latter are histologically comparable with the former. He assumes that traumatism plays a considerable part in producing the lesion. Whether this be so or not, it is the fact that lesions are fairly frequently found in the tonsils, though I have not observed the same in the intestinal glands. It is by no means a regular occurrence to find the tonsils showing abnormality, even when the submaxillary glands are the seat of disease.

Pigs also are much more susceptible to infection by the tubercle bacillus than are other food animals. The bovine, human, and avian types of bacilli all produce lesions in the pig, and although there is apparently a different intensity or virulence dependent upon the type of attacking organism, it is not possible to be certain from macroscopic appearances which type is present in any particular case.

The infection in the pig is more progressive than in bovines. In the latter, retrogressive changes and chronicity are features, but in the pig the disease progresses more rapidly, and fibroid changes are not so frequently met with, dissemination being the rule rather than the exception, and that within a few months of infection. The dissemination also appears to be more extensive, since the liver and spleen frequently show many more lesions than is the case in bovines and also at an earlier date, when the characteristics of the primary lesion in each are compared.

This increased susceptibility and greater power of extension by the blood stream probably also account for the greater frequency of infection of the systemic lymphatic glands and of lesions in the bony skeleton which are met with as compared with corresponding conditions in bovines.

Type of Tubercle Bacilli Observed in Pig Tuberculosis.

Various observers have investigated the type of the bacillus which gives rise to tuberculosis in pigs since the Royal Commission directed attention to the fact that tuberculosis in the pig might be due to bacilli of the bovine, avian, or human type; 59 cases were examined for the Commission with the following result (Table VII.):—

Table VII.

Degree of tuberculosis in the pig.	Bovine virus.	Human virus.	Avian virus.	Mixed avian and bovine.	Total.
Local tuberculosis	18	3	5	—	26
Generalised	32	—	—	1	33
Total	50	3	5	1	59

Eastwood and Griffith [6] obtained tubercle bacilli in culture from 78 pigs, and of these 26 were of the avian, 47 of the bovine, and 1 of the human type. There was one instance of mixed avian and bovine and one of mixed bovine and human, whilst in two instances atypical types were recognised. It follows that in the Royal Commission's cases of pig tuberculosis 5 out of 59, or 8·5 per cent., were due to avian tuberculosis, and in Eastwood and Griffith's cases 26 out of 78, or 33 per cent.

As bearing on these figures it is interesting to note that the Commission state "in the guinea-pig the avian bacillus does not induce progressive tuberculosis, and the lesions produced may be "minimal," and further, "in our experience the bovine bacillus only has been found to be the cause of natural generalised tuberculosis in the pig." Another conclusion arrived at was to the effect that "a mixed infection with human and bovine tubercle bacilli must be considered possible in the pig, although it was not found in any of the cases investigated by us." Eastwood and Griffith discovered one such case.

Christiansen [7] examined 118 tuberculous pigs and determined the type of bacillus in 114 cases. Of these he found the disease was due to the avian type in 86 instances (75·5 per cent.) and to the bovine in 28 (24·5 per cent.). These totals show a much higher percentage of avian infection than in those already mentioned, and probably local circumstances relating to the manner of feeding or the prevalence of fowl tuberculosis might account for it. It should be remembered that the cases examined both by the Royal Commission and Eastwood and Griffith were selected cases. In the former group, attention was directed mainly to slight cases of tuberculosis, and in the latter the investigation related to tuberculous lesions macroscopically limited to the primary seats of infection.

Inspection of Pig Carcasses.

The recommendation of the Royal Commission in cases of pig tuberculosis is to the following effect:—

In view of the greater tendency to generalisation of tuberculosis in the pig, we consider that the presence of tubercular deposit in any degree should involve seizure of the whole carcass and of the organs.

This is an extremely sweeping recommendation, and remembering the considerable prevalence of tuberculosis in the pig, it demands the fullest justification if it is to be literally observed. I have failed to discover in the report of the Royal Commission any evidence in support of the recommendation. A decision as to whether such a high standard is really necessary may best be arrived at by studying the location of the disease in pigs.

Christiansen, as already stated, examined 118 pigs and ascertained the type of bacillus present in the lesion; he also classified the lesions as follows (Table VIII.):—

Table VIII.

Tuberculous lesions.	No. of pigs examined.	Type of bacillus present.		
		Avian.	Bovine.	Undetermined.
Localised to mesenteric lymphatic glands ...	61	58	1	2
Localised to cervical glands	15	7	7	1
Affecting both mesenteric & cervical glands	9	9	—	—
Affecting lymph glands generally and viscera	33	12	20	1
Total	118	86	28	4

It will be observed that in the avian type of infection there is a great tendency to infection of the mesenteric glands, and that there is a greater frequency of generalisation in the bovine type, 20 out of 28 cases, than in the avian, 12 in 86 instances. The tabulation as given would appear to suggest that of the 118 cases it would only have been justified to condemn the whole carcass in 33.

As regards English experience, the cases investigated by Eastwood and Griffith may be used, as these workers give sufficient information to allow of conclusions being drawn from the meat inspection point of view. This work was conducted mainly from the pathological standpoint, but I have their permission to use their records in the manner suggested.

[5] La Tuberculose du Porc, Épidémiologie, Pathogénie, et Évolution comparée par P. Chaussé. Annales de l'Institut Pasteur. Lxxix., Mes. 11-12 (Nov., Dec., 1915).

[6] A Report on Localised Tuberculosis in Swine, by A. Eastwood, M.D., and F. Griffith, M.B. (Reports of the Local Government Board. New Series, No. 91.)

[7] Extract, Hygiène de la Viande et du Lait, July, 1914, No. 7, p. 351.

In Table IX. the cases are arranged according to the location of the primary lesion, and the numbers in the last column refer to the case number in the original work.

TABLE IX.—*Classification of Eastwood and Griffith's Cases.*

Group.	Type of bacillus.		Reference number.*
	Mammalian.	Avian	
Strictly localised cases—			
Submaxillary glands	11	10	M. 14, 70, 71, 75, 76, 77, 79, 82, 86, 88, 95 A. 31, 38, 39, 44, 67, 68, 72, 89, 92, 97
Mesenteric glands	—	—	—
Double infection of submaxillary and mesenteric glands	2	2	A. 61, 69 M. 30, 74
Extension from the primary lesion to adjacent organ or its gland—			
Submaxillary gland to lungs or bronchial gland or both	5	2	M. 19, 55, 73, 84, 99 A. 10, 15
Mesenteric gland with extension to the liver and portal gland	—	3	A. 9, 17, 18
Extension in cases of apparent double primary infection of cervical and mesenteric glands to adjacent organs—			
Deposits in liver only	—	1	A. 73
,, ,, lungs ,, ...	2	—	M. 46, 47†
,, ,, both liver and lungs ...	2	2	M. 48, 94 A. 50, 53‡
Infection of mesenteric gland with extension to liver and later to lungs...	—	1	A. 23
Totals	22	21	—

* M. = Mammalian. A. = Avian.

† In Case 47 the submaxillary gland was tuberculous and possibly one mesenteric gland. The lungs showed lesions but not the bronchial glands. The liver was normal, though there were two or three caseous foci in the portal gland. The case is regarded as one of double primary infection with extension to the lungs from the cervical glands.

‡ In Case 53 infection in the lungs was demonstrated by inoculation of apparently healthy tissue. There were no macroscopic lesions.

Of the above cases, 22 were instances of infection by the mammalian type of bacillus and 21 by the avian. There is no suggestion of special incidence of infection of the mesenteric glands. All are instances either of strict localisation or of extension only by way of the venous blood stream, the possible exceptions to the latter being Cases 48, 94, 50, and 53. In these it is not possible to state definitely whether the liver was infected by way of the portal vein or the hepatic artery. It was probably the former, as no other lesions were discovered, and the spleen and inguinal glands (the only systemic glands examined) were free.

All these carcasses might safely have been passed for human consumption after condemnation of the head and neck and internal organs.

In these cases there does not appear to be much difference in distribution between those due to the mammalian type of organism and those in which the avian bacillus was found, but in considering more extensive dissemination in which the arterial blood stream appears certainly to have conveyed the infection, the differences are more pronounced. A definite conclusion that the arterial blood stream has been the means of conveyance is assumed when the liver is infected without associated lesions in the mesenteric glands or where the spleen is affected.

TABLE X.—*Instances of Disseminated Mammalian Infection.*

Case No.	Submaxillary gland.	Lungs.	Bronchial gland.	Mesenteric gland.	Liver.	Portal gland.	Spleen.	Inguinal.	Case No.	Submaxillary gland.	Lungs.	Bronchial gland.	Mesenteric gland.	Liver.	Portal gland.	Spleen.	Inguinal.
33	+	+	+	—	+	+	+	—	93	+	+	+	—	+	—	—	—
36	+	+	+	—	+	+	+	—	59	+	+	—	—	+	+	+	—
42	+	+	+	—	+	?	+	?									
43	+	+	+	—	+	+	+	—									
49	+	+	+	—	+	+	+	—	24	+	+	+	+	+	?	+	?
54	+	+	+	—	+	?	+	—	51	+	+	+	+	+	+	+	—
85	+	+	+	—	+	+	+	—	63	+	+	+	+	+	+	+	?
83	+	+	+	—	+	—	+	—	90	+	+	+	+	+	+	+	—
86	+	+	+	—	+	+	+	—	98	+	+	+	+	+	+	+	—
41	+	+	+	—	+	—	—	—									
45	+	+	+	—	+	+	—	—	25	—	+	+	?	+	+	+	+

Table X. shows the location of the lesions in cases of arterial dissemination. The first series consists of cases in which the primary lesion was in the submaxillary glands, and the second in which there were probably two seats of primary infection—viz., mesenteric glands as well as submaxillary; the single case in the third group (No. 25) showed no lesion in the cervical gland, and the mesenteric gland was not examined. It is possible that the primary deposit was in these latter glands, and dissemination followed the usual course.

It will be observed that the liver was affected in association with a primary lesion of the submaxillary gland, but without splenic lesions in three instances, and with lesions of the spleen in 10. In the five cases of double primary infection the spleen contained tuberculous lesions in all. The spleen and inguinal glands were affected in Case 25.

All the above were instances of infection with the bovine bacillus, and in all there were lesions in the lung. No instance of similar combinations resulting from avian infection was observed. This is interesting, but it is important to note that in both avian and bovine infections dissemination by the arterial stream would seem to be frequently possible without lesions showing in the lung. It is not easy to account for the disposition of certain lesions except on this hypothesis, and I have frequently seen instances in which the most careful examination of the lung has failed to indicate the presence of lesions when they have been observed in the liver, the mesenteric glands being free or if the latter was affected, then in the spleen. Unless such a possibility is granted it would require the suggestion of backward flow to the splenic gland, and thence into the parenchyma of the organ to account for it.

The grouping of these cases is set out in Table XI. :—

TABLE XI.—*Instances of Dissemination by the Arterial Blood Stream without Macroscopic Evidence of Disease in the Lungs.*

No.	Submaxillary gland.	Lungs.	Bronchial gland.	Mesenteric gland.	Liver.	Portal gland.	Spleen.	Inguinal.	Observations.
Avian.									
29	+	—	—	N*	+	+	—	—	Inoculation of liver and spleen proved presence of T.B. in these organs.
52	+	—	—	+	?	—	—	—	
58	+	—	—	—	—	—	—	—	
60	+	—	—	—	?	—	—	—	Spleen tissue gave positive result, but liver tissue negative.
64	+	—	—	—	—	—	—	—	T.B. demonstrated in muscular tissue.
66	+	—	—	—	?	—	—	—	T.B. demonstrated in liver.
Mammalian Type.									
35	+	—	—	+	—	N*	+	—	Culture obtained from lesion in spleen; there was only one nodule.
62	+	—	+	+	+	+	—	—	Apparently infection passed through lungs to bronchial gland.
81	+	—	—	+	—	—	+	—	Spleen showed one tubercle under capsule and one in substance of organ.
91	+	—	—	—	—	—	—	—	T.B. demonstrated in liver substance.
99	+	—	+	—	?	—	—	—	Infection of bronchial gland suggests infection by way of lungs.

* Not examined. T.B. = tubercle bacilli.

In the above cases, therefore, the organisms were discovered in situations which would indicate that they must have passed through the lungs to reach the localities where they were found, and in doing so had failed to give rise to recognisable lesions. There seems a greater possibility of the avian type getting free without giving rise to pathological changes than of the mammalian, for it will be seen that in the avian infections the organism was discovered in four instances in spleens which show no macroscopic lesion, whereas in the mammalian cases lesions were observed in the two spleens in which bacilli were demonstrated in apparently normal tissue. Possibly the greater virulence of the mammalian type gives rise to an earlier reaction of the tissues which would tend to enclose the primary focus, whilst the tissue being more tolerant of the avian, escape is more easy and frequent. In any event the frequency of bacilli in organs, apart from recognisable lesions, would indicate that in tuberculous infection of any degree in the pig the internal organs should be condemned.

In the case of pigs in which infection resulted from intentional feeding on infected material the same results were observed. Several of the infected animals might with safety have been passed for human food, and in certain organs

bacilli were found apart from recognisable lesions. Table XII. gives the situation of the lesions in animals purposely infected.

TABLE XII.—*Location of Lesions in Pigs found to be Tuberculous after Feeding on Infected Material.*

Case.	Sub-maxillary gland.	Lungs.	Bronchial gland.	Mesenteric gland.	Liver.	Portal gland.	Spleen.	Other organs.
4	+	+	—	—	—	—	—	—
5	+	—	—	+	—	—	—	—
10	—	—	—	+	+	+	—	—
17	—	—	—	+	+	+	—	—
6	—	+	—	+	+	+	—	—
9	+	+	+	+	+	+	—	—
11	—	+	+	+	+	+	—	K
12	+	+	+	+	+	+	+	—
13	+	+	—	+	+	—	—	—
14	+	—	—	+	+	—	—	—

K = kidney.

Of the above, Cases 4, 5, 10, and 17 might certainly have been passed for human consumption. Cases 6 and 9 might have been passed assuming the systemic glands had been free from infection and the lesions in the lungs slight. Case 11 shows severe dissemination from infection of the kidney, and Case 12 from infection of the spleen. In Cases 13 and 14 the pigs were fed with the human type of bacillus, and again these could have been passed assuming the systemic glands had been free, and in the case of 13 the lungs only slightly affected. In all cases internal organs would require to be condemned and the vertebral column split open and examined and the affected heads and necks removed and condemned.

In these animals the presence of tubercle bacilli was demonstrated in apparently healthy organs in two out of three lungs and one out of nine submaxillary glands examined. In the case of apparently healthy tissue from organs showing lesions of tuberculosis, bacilli were demonstrated in one only out of three examinations of lung tissue, but in three out of four examinations of liver tissue.

Negative results followed the examination of apparently healthy bronchial gland (1 case), mesenteric glands (2 cases), liver (2 cases), and spleen (6 cases). Apparently normal tissue taken from organs showing lesions gave a negative result in one case each of submaxillary gland and mesenteric gland.

DIFFERENCES BETWEEN LESIONS OF AVIAN AND BOVINE ORIGIN IN THE PIG.

The slight pathogenicity of the avian bacillus for man would appear to suggest that if any striking characteristics existed between the types of lesions produced by the avian and bovine bacilli respectively which admitted of recognition by a meat inspector, a differential treatment of affected carcasses might be desirable. Eastwood and Griffith consider this point, and state that:—

> When the infection was due to the typical bovine bacillus, the glands were commonly enlarged, often to a marked extent, and frequently the adjacent glands had become fused into a coherent mass. On section the gland substance was often found to be partly or completely replaced by fibro-caseous, gritty material, embedded in a firm, translucent matrix. When the infection was due to the avian bacillus, the glands were often not enlarged, and when enlargement was present, it was usually slight or only moderate in amount. On section, the glands were found to contain a varying number of caseous and gritty or calcareous nodules, which were easily shelled out of the surrounding gland tissue and left behind smooth, fibrous-walled cavities. But there were several instances where the macroscopic appearances failed to give correct indication of the type of bacillus causing the infection.

In these circumstances it is therefore obvious that reliable differentiation is not possible, and that tuberculous lesions in the pig must all be regarded from a standpoint which ignores the type of the infecting organism, and any regulations should be framed with the object of safeguarding the consumer against the type showing the greatest pathogenicity.

ACTION ADVISED IN THE CASE OF PIG TUBERCULOSIS.

In general, there does not seem to be sufficient reason why the general principles regulating the inspection of bovine carcasses should not be applied to the inspection of pig carcasses, provided due weight is paid to the special points of difference which are known to exist. These are as follows:—

1. Primary infection of the lungs in pigs is met with only infrequently in slaughter-houses. Lesions in the lung are therefore nearly always of the embolic type. Primary infection of the digestive tract, on the other hand, is the common form.

2. The ratio of cases showing lesions carried by the blood stream is higher in pigs than in cattle and therefore total condemnation must of necessity be more frequent.

3. The lungs frequently fail to show lesions when these are present in other organs so that absence of lesions in the lungs does not justify the assumption that there has been no dissemination.

4. Tuberculous lesions of bones and joints are more frequent in the pig than in the ox.

5. Dissemination follows with fair rapidity and the disease is generally progressive in pigs. On this account and for reasons above mentioned tuberculosis in the pig, in even slight amount in the cervical or mesenteric glands, requires as a routine (*a*) the examination of all organs, if these are available; (*b*) the examination of bones and joints, particularly the cervical column, by splitting down, and the ribs for nodules, as well as a careful inspection of the hock-joints, opening these up if necessary; and (*c*) an examination of the prescapular, precrural, and supramammary glands. Any evidence of deposit in situations (*b*) and (*c*) calls for condemnation of the whole carcass.

6. The pig is prone to attack by any of the three types of organism. In numerous instances the internal organs contain living bacilli without macroscopic evidence of the disease. The internal organs of a tuberculous pig should always, therefore, be condemned. This recommendation may be criticised from the point of view that if bacilli rest in the organs they may likewise do so in the tissues, and therefore, if it is necessary to condemn organs it should be necessary to condemn the carcass. The reasons against this are that the organisms which do not give rise to lesions are mostly of the avian type. The mammalian type is usually associated with macroscopic lesions. The bacilli seem able to reside in these organs for a longer period than in the muscular system. In the latter case they soon appear to pass into the lymphatic glands and either set up lesions or are destroyed. Note the few instances in which mammalian bacilli were found in organs apart from lesions.

7. Pigs are often submitted for sale in wholesale markets with the heads and necks or lymphatic glands removed. No organs either are attached. Power should be given to condemn such carcasses, as these removals are generally on account of tuberculous infection and it is essential that the character of the lesion should be examined in certain instances.

8. Tuberculosis of the pleura and peritoneum is not so common in the pig as in the ox and when it does exist it is usually a later manifestation in the former than in the latter and much more frequently calls for total condemnation.

POOR-LAW MEDICAL OFFICERS' SALARIES.—The Axminster (Devon) board of guardians have decided to increase the salaries of their district medical officers by one-third for the duration of the war.

TUBERCULOUS SOLDIERS IN CORNWALL.—At the last meeting of the Cornwall County Council a letter was read from the Cornwall Patriots Committee, offering to erect a suitable home for sailors and soldiers who were suffering from advanced tuberculous disease. The committee required that a suitable rent should be paid and that after the war the county council should take over the home permanently. The county council unanimously resolved to accept this generous offer.

THE LATE DR. T. HOPE LEWIS, AUCKLAND, N.Z.—By the death of Dr. T. Hope Lewis, of Auckland, the profession has lost one of its most respected and well-known members. At an early age he entered the Navy, and after a few years' service he went to New Zealand and took the position of medical officer to the thermal springs at Rotorua. At the end of his engagement he commenced practice in Auckland and soon made a name for himself as a surgeon. For some months before his death he acted as a consulting surgeon to the New Zealand Forces and it was while on this service that his death took place.

THE IMMEDIATE EFFECT OF CIGARETTE SMOKING ON HEALTHY MEN AND ON CASES OF "SOLDIER'S HEART."*

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IN this war, as in wars of the past, many soldiers prove inefficient because they become unduly breathless on the exertion which military service entails. The same individuals often complain of præcordial pain, palpitation, giddiness, and exhaustion. Some of these cases present the signs of valvular disease of the heart (V.D.H.), and are discharged from the Army on this account. Yet in the majority of soldiers with these symptoms no abnormal physical signs are found; these are classified in the Army Medical Service as D.A.H. (disordered action of the heart); the terms "soldier's heart" and "irritable heart" have also been applied to them. A clinical account of these disabilities has been published by one of us.[1,2]

It has been freely asserted that excessive smoking, particularly of cigarettes, is one of the most potent causes of the condition. Where so many factors are in operation a definite conclusion as to the truth of this assertion must prove difficult. The end-results of enforced abstinence from tobacco in these patients would give the most direct answer. The difficulties of carrying through such a line of observation and the risk of deception by the patient seemed too great to accept. Hence, as a lesser contribution to the problem, we decided to investigate the immediate effect of cigarette smoking on the circulation and on the reaction to exertion of these patients, and to compare this with its effect on healthy soldiers in training. The opportunity for this work was obtained at the Hampstead Military Hospital for Heart Cases, where various investigations upon the nature of these disabilities have been instituted in co-operation with the Medical Research Committee.

Previous Observations.

We have attempted to abstract all the chief published observations on the immediate effect of tobacco smoking on the circulation of healthy men. The literature abounds in clinical accounts of patients whose symptoms or diseases are ascribed to excessive smoking; with these we are not here concerned, nor with the pharmacological problem of the active or noxious ingredient of tobacco smoke. Of some 50 papers abstracted we here summarise all those which contain any series of actual observations on the subject in hand.

Hesse[4] observed the effect of cigar smoking on the pulse-rate and blood pressure of 25 subjects, chiefly patients with various chronic diseases. One reading was taken before smoking and one after each cigar. In the majority there occurred an increase in pulse-rate, together with a rise in blood pressure.

Lee[6] has contributed an important paper on the subject. From observations on eight healthy men he concludes as follows: In the novice there is always an initial rise of systolic blood pressure (10–20 mm. Hg.), and the pulse is quickened somewhat. Symptoms of shock and collapse are followed by a fall in pressure. In moderate smokers the blood pressure rises slowly (10 mm. Hg.), and this is usually associated with acceleration of the pulse. In an excessive smoker the pressure rises 2–4 mm., and the pulse is unaffected.

Bruce, Miller, and Hooker,[2] from observations on two healthy young men accustomed to moderate smoking, conclude that after smoking (pipe, cigar, or cigarette) there is usually an increase in heart-rate. The increase is not great and may be absent altogether, even when the blood pressure shows distinct changes. The maximum and minimum pressures usually rise slightly, the maximum the more, so that the "pulse pressure" tends to increase.

An article by Nicolai and Staehelin,[10] though it contains no observations on the immediate effect, is noteworthy as a serious attempt to ascertain the effect of smoking continued over a period of six months. During this time each of the authors smoked 6–8 cigars daily, then they abstained from smoking for six months. In Staehelin's own case the pulse-rate, as shown by the mean rate on three days, was 82 during the smoking period and 75 during the period of abstinence. Similarly the pulse-rate after a standard exertion was 157 compared with 124 per minute. Not only was the pulse-rate after exertion higher during the smoking period, but it took much longer to return to the normal. The blood pressure was rather higher during the months of smoking, but the readings were not uniform. In the case of Nicolai himself similar results were obtained, but the figures were unfortunately lost.

John[5] tried the immediate effect of smoking two cigars on nine patients with various chronic diseases. The von Recklinghausen apparatus was used to determine diastolic pressure, and a few individual charts are produced. He concludes that there is a clear increase in diastolic pressure while the systolic pressure is variously affected, and that the pulse sometimes decreases in rate.

Frankl-Hochwart[3] records extensive observations on the effects of smoke-laden atmospheres. Of 28 healthy doctors thus exposed passively to the effect of smoke, 23 showed some change in blood pressure; in half of them it fell. The effect of actually smoking three Egyptian cigarettes during 3–12 minutes was observed in seven smokers and three non-smokers. If affected at all, the blood pressure generally fell, but the change both in pressure and in pulse-rate differed greatly in different subjects. A combination of active and passive smoking produced the greatest changes. Denicotinised tobacco had little effect. It does not appear that more than one observation was made before and another after smoking in these experiments.

Aikman,[1] in a careful article on the effect of smoking on the circulation, includes his own experiments on 28 young healthy smokers, using a single Turkish cigarette in each case. Of 27 cases, the pulse-rate increased in all but 4, and 16 showed an increase of more than eight beats per minute. In four heavy smokers the pulse increased by over 40 beats. He noted an initial decrease of 4–6 beats in three cases. He claims that the pulse became "irregular" in ten cases, but the nature of the arrhythmia is not stated and no graphic records are furnished. The effect on the blood pressure and the "pulse pressure" was varied.

Class of Case.

The patients were soldiers between the ages of 17 and 32. They all complained of undue breathlessness on exertion; what is more, they appeared more breathless after simple exercises than did healthy men. Other symptoms such as præcordial pain, palpitation, giddiness, and exhaustion, were present in many. We excluded all cases which we believed to be suffering from valvular disease or obvious myocardial disease. Indeed, no abnormal physical signs were found in any of the cases used. The men were not confined to bed, and they left the hospital each afternoon for walking exercise. All were smokers, and their habit in this respect is indicated in Table I. They were consecutive cases and were not selected because smoking was presumed to be a special factor in the production of their symptoms.

The controls were healthy cadets in training, between the ages of 20 and 28; all were cigarette smokers, and had presented no symptoms while undergoing the usual physical training of a soldier.

Most of the patients and controls began to smoke between the ages of 15 and 18. About half the patients and half the controls admitted that they smoked more since enlistment than before. Two patients (Cases 4 and 12) and one control (6) first began to smoke after enlistment.

The degree of staining of the fingers, which was present in most of the subjects, did not prove helpful in estimating the severity of the cigarette habit. The use of a holder, the avoidance of smoking cigarettes to the end, and thorough cleansing of the fingers, suffice to prevent much staining even in heavy smokers.

Method of Observation.

Attention was confined to the effect of smoking on (1) pulse, respiration, and blood pressure, and on (2) reaction to exertion.

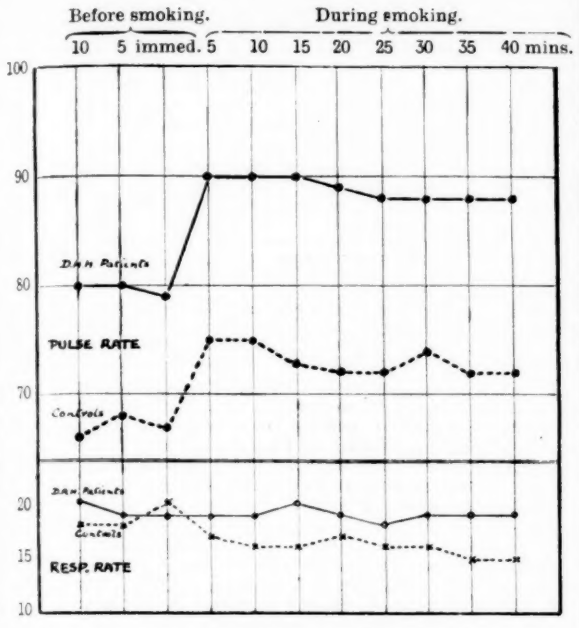
Before the observations on actual smoking were commenced the patient performed a simple exertion test, and this was repeated when the period of smoking was over.

The observations were made in the afternoon (two hours after lunch), at a time when the subjects had refrained from smoking for a period of five hours. The Mackenzie ink polygraph was always used to record the pulse and respiration. The respiratory-rate was obtained by connecting the second tambour of this instrument with a respiratory-bag held against the chest wall by a light belt.

After the apparatus had been adjusted the patient lay quietly on the bed for at least 15 minutes. Half-minute records of the pulse and respiration were then taken simultaneously every five minutes until three consecutive readings were practically constant.

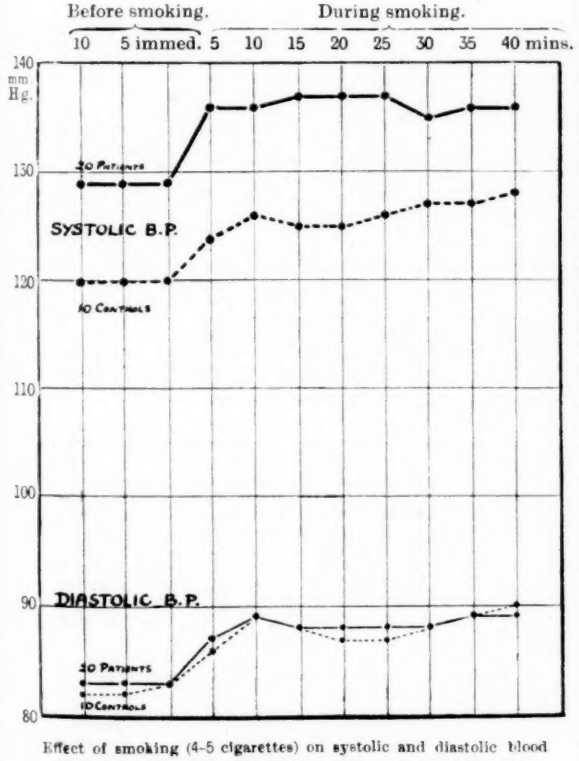
* Undertaken on behalf of the Medical Research Committee.

CHART 1.



Effect of smoking (4–5 cigarettes) on pulse- and respiratory-rates in 20 patients (D.A.H.) and 10 controls (healthy men).

CHART 2.



Effect of smoking (4–5 cigarettes) on systolic and diastolic blood pressure in 20 patients (D.A.H.) and 10 controls healthy men).

Without disturbing the apparatus the patient was then made to stand and a continuous record of the standing-rate was taken for two minutes. The rate for the first six seconds was considered the *immediate* rate, and is so named on Chart 3; otherwise the record was divided and counted in half-minute periods. The patient was then disconnected, though the wrist-splint and respiratory-bag were left in place, and he was made to walk a few yards to a flight of 25 steps, which he descended and climbed once at a quick walking pace. On his return the recording apparatus was reconnected (within three seconds) and a continuous record was taken for three consecutive minutes, with the patient standing. As before, the rate during the first six seconds was called the "immediate rate." The patient finally lay down on the bed and a record of two minutes' duration was taken. This series of observations will readily be understood on reference to Chart 3 (q.v.).

The first exertion test having been completed, a Riva-Rocci mercurial sphygmomanometer (Martin's modification) was also applied. The auscultatory method was used: the systolic pressure was read when the sounds first appeared as the mercury fell and the diastolic when the clear, loud sounds became soft and murmur-like.* Blood-pressure readings (systolic and diastolic) and pulse- and respiratory-rates were taken at five-minute intervals until three consecutive readings were alike. The patient, still lying on his bed, was then asked to smoke cigarettes, one after another, until either four or five had been consumed. The first cigarette, smoked rather quickly, was finished in the first five minutes, and the whole period of smoking occupied about 40 minutes. The pulse-rate was recorded continuously during the first five minutes of smoking. Subsequently pulse- and respiratory-rates and blood-pressure readings were recorded every five minutes. While the polygraphic record was actually being taken, smoking was suspended so that the respiration curve should not be modified by the act of smoking. After the last cigarette three constants of pulse and respiration were obtained, and the exertion test, as performed before smoking, was repeated in its entirety.

In all the observations a small Virginian cigarette was used; the brand actually employed was that sold under the name "Wild Woodbine," a cigarette in common use among soldiers. The weight of five of these cigarettes was 4·8 grammes and the weight of the unsmoked ends was about 1·4 grammes; thus from 3 to 4 grammes of this tobacco were consumed by each subject.

Effect on the Pulse-rate (see Chart 1 and Tables I. and II.).

In general there was a moderate increase in the pulse-rate.

Among 20 patients the average rate before smoking was 80 and during smoking 89, an increase of 9 beats. The rate increased in all cases except three non-inhalers in whom it remained constant.

In a single case the average pulse-rate before smoking was 64 and during smoking 93, an increase of 29 beats. In the remainder, the increase ranged from 3 to 15 beats. There was a sudden increase in the average rate during the first half-minute of smoking from 80 to 87, and during the remainder of the first five minutes a gradual increase to 93. At no time during the first five minutes was slowing of the pulse observed, either in the average or indeed in any individual case; no preliminary slowing took place, such as is described in animals after the introduction of nicotine. It is probable that the initial decrease in pulse-rate sometimes described in man is quite incidental or due to inexact methods of recording rate. The pulse-rate usually rose within five minutes (and during the first cigarette) to a maximum which was almost maintained throughout the period of smoking (see Chart 1). Among the inhalers, comprising half the cases, the average pulse-rate during smoking was 11 beats higher than before smoking was commenced; in non-inhalers the average increase was seven beats (see Table III.).

The average pulse rate in ten healthy soldiers *(controls)* before smoking was 67 and during smoking 73 (see Table II. and Chart 1). The increase is rather less than in the D.A.H. patients, but similarly the maximum average pulse-rate was reached at the end of five minutes and this rate was maintained throughout the period of smoking. The pulse-rate was increased in all but two cases; in one of these the rate before smoking was 68 and during smoking 64, in the other it was unaffected. Irregularity of the pulse referable to smoking was not observed in any case of either series, though normal sinus arrhythmia was often seen before and during smoking.

Effect on Respiratory Rate (see Chart 1 and Tables I. and II.).

The average respiratory rate remained unaffected among the patients as a whole and also among the inhalers as a group. In half the cases the rate increased slightly, in the other half it decreased. In no case was there an increase of more than four per minute.

In the *controls* the average respiratory rate before smoking was 18 and during smoking 16. In three cases there was a slight increase, in two it remained unaltered, while in five it decreased. In two of the latter the rate decreased by seven per minute during smoking.

Effect on Blood Pressure (see Chart 2 and Tables I. and II.).

In 15 of the 20 patients the blood pressure, both systolic and diastolic, was definitely raised. In the remaining 5 cases it rose very slightly or not at all. In none did a fall of blood pressure occur.

TABLE I.—*Immediate Effect of Smoking Cigarettes (4–5) in 20 Patients ("Soldier's Heart").*

N, no; Y, yes; Inc., increased; Unc., unchanged.

No.	Age.	Cigarettes smoked daily.	Inhales.	Breathlessness on exertion test after smoking.	Average pulse-rate.		Average respiratory-rate.		Average systolic blood pressure.		Average diastolic blood pressure.	
					Before smoking.	During smoking.	Before smoking.	During smoking.	Before smoking.	During smoking.	Before smoking.	During smoking.
1	23	10	N	Inc.	88	105	12	16	137	141	82	85
2	20	15	Y	,,	65	74	15	14	147	149	90	92
3	23	10–12	Y	Unc.	68	76	17	14	120	134	67	81
4	20	10	N	Inc.	79	93	21	22	138	143	77	80
5	23	15	Y	,,	78	87	16	17	130	147	87	92
6	21	10	Y	Unc.	83	95	15	16	110	123	75	85
7	22	15	Y	,,	67	80	31	24	120	130	88	88
8	32	20	Y	Inc.	70	77	22	22	115	123	73	81
9	17	5–10	N	,,	78	79	13	14	120	121	82	81
10	24	20	Y	,,	79	84	20	17	120	133	72	81
11	19	5	N	Unc.	78	77	19	21	110	112	78	81
12	22	5	N	,,	73	87	28	23	130	140	80	82
13	22	2	N	,,	89	94	13	14	145	150	102	104
14	27	5–10	Y	Inc.	85	94	25	25	125	138	88	96
15	23	10	N	,,	84	87	21	19	143	151	78	88
16	21	—*	N	Unc.	91	96	23	20	140	143	87	91
17	29	6–7	N	Inc.	97	98	19	16	135	137	90	92
18	30	10	Y	Unc.	64	93	22	23	120	133	93	97
19	22	8	N	Inc.	88	98	28	30	130	132	80	84
20	23	10	Y	,,	89	101	11	13	140	148	93	100
		Average ...			80	89	19	19	129	136	83	88

* 2 oz. pipe weekly.

TABLE II.—*Immediate Effect of Smoking Cigarettes (4–5) in Healthy Men (10 Controls).*

1	27	10	Y	Unc.	60	68	15	16	118	127	82	87
2	28	30	Y	,,	55	66	18	11	110	119	72	83
3	25	20	Y	,,	69	79	21	15	115	126	82	87
4	24	15	Y	,,	68	64	21	24	135	133	85	83
5	21	15	Y	,,	76	75	18	15	115	121	78	83
6	23	15	Y	,,	67	75	19	13	130	136	90	94
7	20	20	Y	Inc.	68	74	19	19	110	116	85	91
8	29	25	Y	Unc.	64	73	14	14	125	126	88	88
9	23	25	Y	Inc.	77	82	17	19	117	128	80	91
10	26	25	Y	Unc.	66	75	22	15	125	131	85	92
		Average ...			67	73	18	16	120	126	83	88

TABLE III.—*The Effects of Smoking on Inhalers and Non-inhalers Compared (20 Patients).*

—	Average pulse-rate.			Average respiratory-rate.			Average systolic blood pressure.			Average diastolic blood pressure.		
	Before smoking.	During smoking.	Change.	Before smoking.	During smoking.	Change.	Before smoking.	During smoking.	Change.	Before smoking.	During smoking.	Change.
Inhalers (10) ...	75	86	+11	19	18	− 1	125	136	+11	83	89	+ 6
Non-inhalers (10)	84	91	+ 7	20	19	− 1	133	137	+ 4	84	87	+ 3

Systolic pressure.—The average systolic pressure rose almost to its maximum during the first five minutes of smoking—i.e., during the smoking of the first cigarette—at the end of which it had risen 7 mm. Hg. The increase was maintained and varied little during the whole smoking period. In 5 cases the blood pressure did not rise until ten or more minutes had elapsed. Among the inhalers (half the cases) the average systolic pressure rose 11 mm.; in non-inhalers it rose 4 mm. (See Table III.) The greatest individual increase was 17 mm. Four of the five patients in whom the rise was insignificant were inhalers.

The average systolic blood pressure in the *controls* rose to its maximum, an increase of 6 mm., in the first ten minutes and more gradually than in the D.A.H. cases. This increase was again maintained, and reached 8 mm. by the end of the smoking period. The systolic pressure rose in all but two cases, which were unaffected; in these the pulse-rate also failed to increase. In each of two controls the increase was 15 mm. Hg.

It is suggested that the fall in blood pressure so often recorded in previous observations only occurs when toxic symptoms have supervened, and then not in all cases. (See under Toxic Symptoms.)

Diastolic pressure.—The average diastolic pressure in the patients rose more gradually than the systolic and reached its maximum, 6 mm., ten minutes after the commencement of smoking; this increase was maintained. With one exception, in all cases where the average systolic pressure rose, the diastolic pressure rose also. The increase in diastolic pressure among inhalers averaged 6 mm., and among non-inhalers 3 mm.

The average diastolic pressure in the *controls* rose to 5 mm., the maximum, during the first ten minutes of smoking, and the increase was maintained. The curve coincides almost exactly with that of the D.A.H. series.

It is worthy of notice that in repeated and prolonged observations on the blood pressure of any individual the readings tend to fall slightly, even after an apparent constant has been obtained and apart from any pharmacological procedures. This may be due either to prolonged rest during the course of an experiment with disappearance of initial excitement, or it may depend on some temporary change in the vessels of the arm after repeated use of the sphygmomanometer cuff. Illustrative examples have been recorded in papers by Lee[9] and by Parkinson and Rowlands.[1] If allowance were made for this slight fall in pressure during any prolonged observation, the true figures of increase in blood pressure during smoking would actually be rather *higher* than those given.

EXERTION TESTS BEFORE AND AFTER SMOKING.
(See Chart 3.)

The difference in the average pulse-rates on exertion, before and after smoking, though not pronounced, was definite enough.

The difference was as follows: (1) The average recumbent rate was 3-5 beats higher than before smoking; (2) the average standing rate was 8–10 beats higher; (3) the average rate after exertion was 8–10 beats higher; (4) the recumbent rate after exertion was 3–7 beats higher.

These differences would not be significant in a single patient, but we are here contrasting the average rate in 20 patients during the exertion test with the average rate in the *same* individuals on the *same* test, but after smoking. (See two upper curves in Chart 3.)

Controls.—The average pulse-curve during exertion tests following smoking, although at a slightly higher rate (2–4 beats), followed the corresponding curve before smoking more closely than in the D.A.H. series. In other words, among the controls the curve of pulse-rate on exertion was scarcely affected by smoking. The difference between the curves before and after smoking in D.A.H. cases is 8–10 beats; in the controls it is merely 2–4 beats.

Incidentally, another difference between D.A.H. cases and controls, not related to tobacco, is shown in Chart 3. In the former the pulse-rate falls neither so rapidly nor so completely after standing and after exertion as it does in the controls.

The Breathlessness on Exertion after Smoking.

(a) Respiratory-rate on exertion.—As described above, under Method of Observation, the respiratory-rate was recorded graphically during the exertion tests, together with the pulse-rate. Curves of the respiratory-rate on standing and on exertion, before and after smoking, have been prepared from the average figures obtained, curves similar to those of pulse-rate depicted in Chart 3. The respiratory-rate curve on exertion before smoking proved to coincide almost exactly with that after smoking; smoking did not appear to influence it. For this reason, and for lack of space, these curves are not reproduced. The respiratory-rate was not more frequent on the exertion test performed after smoking.

In spite of this fact, and in the absence of graphic proof, we yet consider that *breathlessness* was often greater on exertion after smoking (see paragraph (*b*)).

(b) Breathlessness on exertion.—When each subject returned from his first exertion test, that *before* smoking, we both observed the degree of his immediate respiratory distress

and noted it; nothing was said to him on the matter. When he returned from the second exertion test, that *after* smoking, we again agreed as to the degree of distress and whether it appeared the same as or greater than at the previous test. This time the man's opinion was also asked—viz., whether his breath was about the same as after the previous test, or not. Often he admitted, with a smile, that his "breathing" was more noticeable on this occasion. If we were all in doubt or at variance, the symptom was considered "unchanged." Whereas if we were satisfied that more objective distress was shown, and the patient felt more breathless, we noted that breathlessness was "increased." (See Tables I. and II.).

If, as admitted, the respiratory-*rate* was not more frequent on the exertion after smoking, wherein does the breathlessness lie? Probably it is associated with an increased amplitude of respiration. The subjects appeared to us to breathe more deeply. Unfortunately there does not appear to be any simple clinical method of recording the amplitude of respiration, or rather no method which is sufficiently exact for comparative observations. Hence no graphic evidence is afforded in support of the following observations, which are tabulated in the fifth column of Tables I. and II. (q.v.).

In 12 of the 20 patients breathlessness was more pronounced in the exertion test after smoking; in the remaining eight cases, it was unchanged. Six of the 12 cases affected were inhalers and six non-inhalers, so that the "wind" can apparently be adversely affected by smoking even without inhaling.

None of the *controls* showed breathlessness after the exertion test previous to smoking; but two of them noticed slight breathlessness on the same exertion *after* smoking and objectively appeared breathless.

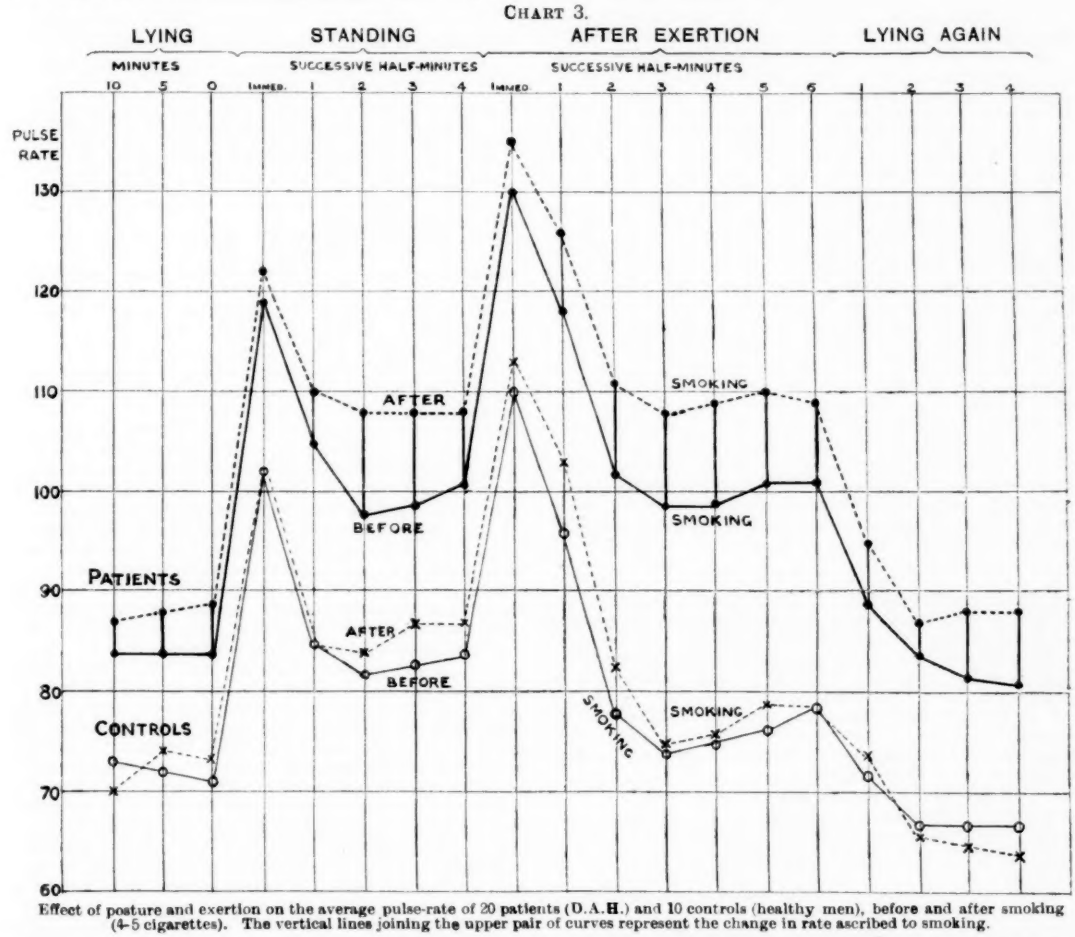
Toxic Symptoms.

In eight of the 20 patients mild toxic symptoms were noted.

With one exception they appeared during the third, fourth, or fifth cigarette. Three men complained of slight giddiness, three of nausea, and two of palpitation. Two complained of præcordial pain; in one the pain was felt during the second cigarette, in the other during the fourth, and it disappeared five minutes after completing the fifth one. The latter stated that smoking frequently produced this pain. Case 7 with his fifth cigarette became pale and nauseated, almost vomiting. The blood pressure was at once taken and the systolic B.P. was found to be 150 mm. Hg. and the diastolic 80 mm. Hg. The corresponding readings five minutes before had been 125 mm. and 80 mm. respectively.

In a second case, not included in the series because the observation were necessarily interrupted, the subject became restless and giddy on completion of his first cigarette. The radial tracing showed a gradual acceleration of rate from 80 to 145, and the pulse then became so small that it ceased to be recorded by the polygraph. When the rate had reached 100 the systolic blood pressure was found to be 165 mm. and the diastolic 90 mm., an increase of 30 mm. and 10 mm. respectively above the rate before smoking.

CHART 3.



Effect of posture and exertion on the average pulse-rate of 20 patients (D.A.H.) and 10 controls (healthy men), before and after smoking (4-5 cigarettes). The vertical lines joining the upper pair of curves represent the change in rate ascribed to smoking.

These two observations indicate that toxic symptoms from smoking may be accompanied by a *rise* in blood pressure. (*Cf.* Lee.[6])

Of the *controls*, two showed toxic symptoms. One began to feel warm after his fourth cigarette, then he perspired, grew pale, and finally vomited. The other became somewhat pale after his fifth cigarette.

Remarks.

The object of our investigations upon smoking has been a restricted one, for we have attempted simply to determine the immediate effect of smoking a few cigarettes upon the circulatory system. This effect has been ascertained in healthy men and in soldiers unduly breathless on exertion, and comparisons are drawn between them. Instrumental methods were used whenever possible. Sufficient preliminary observations formed a control for each individual, and during smoking numerous consecutive readings were

taken. Thus we have obtained a uniformity of result which suggests that the immediate pharmacological action of cigarette smoking, *as commonly practised*, is here correctly described.

With the larger problem of the *later* effects of cigarette smoking indulged in for years we have not attempted to deal. By its nature this subject abounds with difficulties, and a perusal of the literature only emphasises its complexity. Yet it is perhaps allowable for us to make a few direct references to the question of smoking in the etiology of "soldier's heart." We are not of opinion that excessive smoking is the chief or, indeed, a frequent cause of this group of disabilities. In this opinion we are supported by several facts—viz.: (1) An adequate cause for the disability is found in a large proportion. Thus, a history of acute rheumatism is obtained in about 20 per cent. of all cases of any severity.[9] Frequently the trouble dates from dysentery, "trench fever," or other infection. (Mackenzie.[7]) (2) In about 50 per cent. of all cases the symptoms have been present for several years, many have "always been short-winded."[10][12] The mere assertion that smoking has here been the ultimate cause would be futile. (3) More than 20 examples of non-smokers with identical symptoms and characteristics have been investigated at this hospital. (4) There is no evidence, and we do not find from our case histories, that these patients, as a class, smoke more heavily than the average soldier.

On the other hand, we are satisfied that as an accessory cause in the production or accentuation of the breathlessness and pain excessive smoking is of considerable importance. The immediate pharmacological effect of smoking on the circulation of healthy men, habitual smokers, is shown to be not great, but definite enough, and in its direction unfavourable to effort. In patients with "soldier's heart" who are unduly breathless on exertion this disadvantageous effect is rather more pronounced, especially when tested by exertion. Many patients will admit that they experience præcordial distress or pain after over-smoking, and this is confirmed, as we know, by inquiry among smokers in our own profession. The general opinion among athletes is undoubtedly against the use of tobacco when preparing for strenuous muscular exertion. However incomplete our knowledge of the late effects of excessive smoking may be—most incomplete it is—we wish to say, with Aikman, that "certainly we should hesitate to administer any drug having as marked an effect over such periods of time."

Summary.

1. The immediate effect of cigarette smoking upon the circulatory system and upon the breathlessness of exertion was observed in 30 smokers, of whom 20 were cases of "soldier's heart" and 10 were healthy soldiers. Each subject smoked either four or five cigarettes during a period of 40 minutes.

2. A demonstrable effect was recorded in 17 of the 20 patients; the 3 unaffected were non-inhalers. Nine of the ten controls, all inhalers, were influenced in the same fashion, though not to the same degree.

3. The average pulse-rate among the patients during smoking was nine beats higher than before smoking; in the healthy controls it was six higher. Initial slowing of the heart was never observed, nor any irregularity referable to smoking.

4. The rate of respiration in the patients was unaffected; in the controls it was slightly reduced.

5. The average systolic blood pressure was raised by 5–10 mm. Hg. and the diastolic by 5 mm., both in patients and controls.

6. These effects appeared within five minutes; with the first cigarette they almost reached the maximum, and this was maintained throughout the smoking period.

7. A simple exertion test was performed before smoking and repeated on its cessation. In the patients the pulse-rate maintained a higher level throughout the test *after* smoking, and half of them were more breathless both subjectively and objectively. In two patients præcordial pain was induced by smoking, apart from exertion. But in the controls the pulse-rate curve during exertion was much the same after smoking as before, and breathlessness was induced in two only.

8. These observations show that, in health, the smoking of a single cigarette by an habitual smoker usually raises the pulse-rate and blood pressure perceptibly; and these effects are a little more pronounced in cases of "soldier's heart." Moreover, the smoking of a few cigarettes can render healthy men more breathless on exertion, and manifestly does so in a large proportion of these patients.

9. Excessive cigarette smoking is not the essential cause in most cases of "soldier's heart"; but, in our opinion, it is an important contributory factor in the breathlessness and præcordial pain of many of them.

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HORSESHOE KIDNEY BY UNION OF THE UPPER POLES, DIAGNOSED PRIOR TO OPERATION.

WITH CALCULUS IN LOWER POLE ON LEFT SIDE.

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IT is remarkable that almost at the same time I should have under my care three cases, two in the Glasgow Royal Infirmary and one in a private nursing home, which stand alone in my experience, and, as far as I can ascertain, are unfamiliar to writers on the subject of urology. Two cases are unique by reason of the lesions, the third on account of the coincidence of rare genital malformations in both husband and wife. The cases are: (1) Horseshoe kidney by fusion of the upper poles, diagnosed prior to operation for renal calculus; this case is described below. (2) Complete retention of urine in a woman caused by a gumma surrounding the urethra and producing prolapse of urethral mucosa. (3) Bilateral cryptorchism in a man and double uterus in his wife. Of the first of these cases I give the clinical notes and an account of the operative treatment.

Fixed malpositions and malformations of the kidney are not merely pathological curiosities. While on account of their rarity they are not of practical importance to the general practitioner, to the surgeon who desires to protect himself and his patient against catastrophes in the operating room an acquaintance with these abnormalities as well as with malpositions of the kidney is a necessity.

Of the many malformations of the kidney, if we except congenital absence or atrophy of one kidney, the fusion of two kidneys, as met with in horseshoe kidney, sigmoid kidney, and disc-shaped kidney, is the most important. The amount of fusion that takes place between two kidneys varies greatly. We may have the two organs united together across the vertebræ at their lower extremities by a narrow, thin, and flat isthmus, which may be formed of connective tissue only, or the union may be made up of a broad band of kidney parenchyma. These are the lowest degrees of coalescence; from these we meet with all shades of fusion until we reach a condition where the two kidneys become completely incorporated so as to form either one disc-shaped organ, or an elongated body lodged on one side of the spine, the sigmoid kidney.

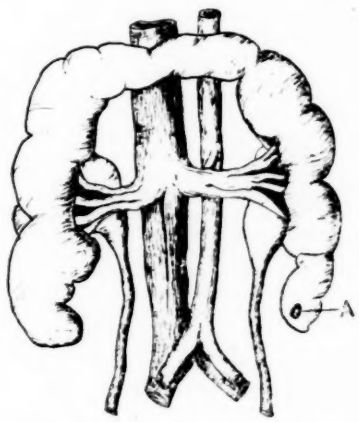
Horseshoe kidney is not only the lowest grade but also the most common form of fusion, and almost without exception it is the lower poles that are joined together; in a very few of the instances recorded the upper ends are united. The present case is one of these, and it is the only one I can discover in which a pre-operative diagnosis was made. In this respect it is unique. Israel, however, diagnosed prior to operation a diseased horseshoe kidney of the more common form, and his diagnosis was confirmed. This is the only other case of clinical diagnosis before operation, one which can be made only in exceptional circumstances and when the surgeon is on the outlook for the condition. I may briefly state the history of the case as received from his medical attendant, Dr. J. D. Walker, Camelon, Falkirk.

The patient was never "strong," and seven years ago (1909) he had an attack of orchitis associated with pyuria which confined him more or less to bed for five months, but ultimately he recovered sufficient

health to resume business and for a few years enjoyed comparatively good health, although practically pus was never absent from the urine. His health was always best during the summer months. In winter, especially in very cold weather, he suffered from pain in the right lumbar region, but it was never very severe until February, 1915, when he had a very violent attack of pain in the right side, accompanied by an increase in the amount of pus in the urine, difficulty in controlling the escape of urine, and vomiting which lasted for nearly a week. Dr. Walker says: "Since I have had him under observation there has not been anything else outstanding. He complained always of the pain on the right side, and sometimes I think there was pain on the left, but this was not constant." In September, 1916, he complained of pain while at stool between the rectum and the bladder, but on examination per rectum nothing was discovered to account for the pain.

Dr. Walker tells me that Dr. A. E. Hunter, of Falkirk, had the urine repeatedly examined bacteriologically, when it was heavily loaded with pus. No tubercle bacilli were found. A coliform bacillus was present, but he was unable to say definitely that it was the *Bacillus coli*. A surgeon in Edinburgh was consulted and a cystoscopic examination made, but as far as I can ascertain no definite opinion was arrived at. "All kinds of urinary antiseptics have been tried, I understand, but without success." Vaccine treatment also was employed (*B. coli*), dose 30 to 50 millions. "The difficulty everyone has had seems to be the site of origin of the pus. Nothing definite was discovered."

I was consulted at the end of October, 1916, and sent the patient into the Regent Nursing Home. He was a slender, thin man, with feeble muscles and lax abdominal walls. He complained of pain in the right lumbar region and frequency in micturition, occasionally associated with bladder irritation, and he always noticed that the urine was cloudy and thick, especially in the morning. With rest in bed the irritation subsided and the lumbar pain disappeared. Cystoscopic examination showed moderate congestion of the mucous membrane at the neck and in the trigone. The right ureteral orifice was practically normal, while the left showed distinct evidence of irritation, the



opening being dilated and the lips irregular and thickened. The urine escaping from the right ureter was clear, that from the left purulent. The X rays showed an oval shadow the size of a horse-bean close to the point of the left transverse process of the second lumbar vertebra; it was not movable on deep respiration.

On palpation, although the patient was very thin, the kidneys could not be felt in their normal position, but when he was under an anæsthetic a horseshoe-shaped mass could be made out, the bridge joining the kidneys being an inch and a half below the ensiform cartilage (see figure). Both limbs of the shoe were narrow bands and extended down to the level of the transverse processes of the second lumbar vertebra. On pressure on the lower pole of the left kidney the patient complained of pain at a corresponding point on the right side.

The diagnosis I made was calculous pyelitis in a horseshoe kidney, the stone being located at the lower pole of the left kidney (A in figure). This diagnosis was confirmed by operation, in which I was assisted by my house surgeons, Mr. J. M. Robertson and Mr. Thomas R. Wilson. The patient made a good recovery and was dismissed from the home in four weeks.

Glasgow.

Corrigendum.—Figs. 1 and 2 of Dr. J. S. B. Stopford's article on Thermalgia (Causalgia) in last week's issue should be transposed. Before operation analgesia was more extensive than anæsthesia, a relation which was reversed by the operation.

A CASE OF CLAUSTROPHOBIA.

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THE case I am about to record is that of a medical man, aged 31, who from childhood has suffered from a dread of being in an enclosed space, and especially of being under conditions which would interfere with his speedy escape into the open.

History of Patient.

His first memory of this dread goes back to the time when at the age of 6 he slept with his elder brother in what is known in Scotland as a box-bed. The bed stood in a recess with doors which could be closed so as to give the appearance of a sitting-room. The child slept on the inner side of the bed next to the wall, and he still vividly remembers his fear and the desire to get out of bed, which he did not satisfy for fear of waking his brother. He would lie in a state of terror, wondering if he would be able to get out if the need arose.

His next memory bearing on his phobia is of being taken to see some men descending the shaft of a coal-pit. There came to him at once the fear that were he going down something might happen to prevent his getting out. He remembers that whenever in childhood he was taken for a journey by train he dreaded the tunnels, and if by chance the train stopped in a tunnel he feared that there might be an accident and that he would not be able to get out. This fear of tunnels became worse as he grew older. When he began to go to the theatre or other crowded building he was always troubled unless he was near the door, and he was never happy unless he could see a clear and speedy mode of exit. He would never travel by the tube railway, and remembers his horror when on one occasion he had to do so. As long as he can remember he has felt an intense sympathy whenever he has read of prisoners being confined in a narrow cell, and he has always been greatly disturbed by tales of burial alive.

He was always very nervous and excitable as a child and suffered from night-terrors. He has been liable, as long as he can remember, to worry without knowing why. When about 12 years old he began to stammer, ascribing its onset to the imitation of a school-fellow. It soon passed off, but ever since he has been liable to stammer when out of health.

During boyhood he had occasional attacks of sleeplessness, loss of appetite, and inability to work. When about 22 years of age he decided to go in for medicine, and while reading for the Preliminary had an attack of this kind more severe than usual, which prevented his working for some time. A similar attack during the second year of his medical studies made him fear that he would have to give up medicine, but the leisure of a vacation restored him, and he completed his medical course. While serving as house surgeon he again broke down in health, but managed to finish his period of office and then did very light work for nine months.

About six years ago, while a medical student, he heard of a German, whom I will call A., who received patients into his house in order to cure them of stammering and other nervous ailments. He stayed with him for two weeks, the treatment consisting mainly of a variety of suggestion in which the patients were told to relax their muscles and concentrate their minds on the qualities they desired to attain. A. had recently become acquainted with the work of Freud, and had visited Vienna in order to learn something of his methods. Some time later the patient again put himself under the care of A. in order to undergo a course of psycho-analysis. The analyst in this case does not appear to have been acquainted with the method of free association, and after an unsuccessful attempt to carry out a series of word-associations the process of psycho-analysis resolved itself into an inquiry into dreams. In company with others the patient was instructed about Freud and his views. He was told that the cause of his trouble certainly lay in some forgotten experience of childhood of a sexual nature. When he related his dreams they were invariably interpreted by means of symbolism of a sexual character. Thus, if he had dreamed of water, he was told that this indicated a wish for sexual intercourse. It is

a striking feature of the process of examination and treatment to which the patient was subjected that it failed to discover the special dread of closed spaces from which he suffered. At this time he had not realised that his dread was exceptional or was capable of treatment. He had supposed that everyone objected to conditions which were so trying to himself, and it was only on account of his stammering and his general nervousness that he had sought treatment. Consequently he told A. nothing about his dread and the process of analysis failed to detect it. Not only did the analysis lead the mind of the patient exclusively in a sexual direction, but it also failed to discover or remedy the claustrophobia.

This process of so-called psycho-analysis had no result which satisfied the patient. On the contrary, after two months of it his sleep became so disturbed and his general condition so much the worse that he gave up the treatment and returned home. Nevertheless, he was left with the firm conviction, which he retained till he came under my care, that the root of his troubles lay in some forgotten sexual experience. This belief was so strong that he continued to search out for himself some forgotten experience of this kind but without success, and shortly before the outbreak of the war he was thinking of going to Vienna to consult Freud and find whether the master himself might not succeed in discovering the lost memory.

War Experience.

The outbreak of the war interfered with this plan. At that time the patient was still suffering from the effects of his breakdown when a house surgeon, but as soon as he had recovered sufficiently he joined the R.A.M.C. and went to France. When he reached the front he had to live and work in dug-outs and was at once troubled by the dread of the limited space, and especially by the fear that he might not be able to get out if anything happened. His dread was greatly stimulated on his first day in a dug-out when, on asking the use of a spade and shovel, he was told that they were to be used in case he was buried. It was only when he found others living and working in comfort in dug-outs that for the first time he realised the exceptional nature of his dread and recognised that he was the subject of an abnormal condition. After two attacks of trench fever his dread was greatly accentuated and increased to such an extent as to make his life almost unendurable. He slept so badly that he had recourse to hypnotics and often spent a large part of the night walking about the trenches rather than remain in his dug-out. His health became so impaired that he was advised by his commanding officer to consult the A.D.M.S., who sent him into hospital. He was there treated by rest and was given paraldehyde every night. He was told to keep his thoughts from his war experience and to dwell exclusively on pleasant topics such as beautiful scenery.

After three weeks in hospital in France he was sent to London where he was again treated by rest and hypnotics. When he came under my care he had been sleeping very badly in spite of the hypnotics. He had been having terrifying dreams of warfare from which he would awake sweating profusely and think that he was dying. These dreams had become less frequent but still occurred. He stammered very badly and was often depressed and restless. He found it difficult to read anything which required a mental effort and complained that his memory was defective, especially for recent occurrences. He had occasional frontal headache and suffered from pain and discomfort after food, which he ascribed to the paraldehyde he had taken, and he was liable to alternating constipation and diarrhœa. His deep reflexes were somewhat exaggerated.

In obtaining his history I learnt about his interest in Freud and about the previous attempts to remedy his condition by means of psycho-analysis. It was only when I explained to him my views concerning the exaggerated interest in sex shown by Freud and his disciples that he learnt for the first time that forgotten experience of other than a sexual kind might take a part in the production of nervous states. It was agreed that "psycho-analysis" should be given a fresh trial from this point of view.

Fresh Trial of Psycho-analysis: Memories Recalled.

The next interview was devoted to a full inquiry into his previous experience in analysis, the results of which have already been given. As a preliminary to the following sitting I asked him to remember as fully as possible any dreams he might have in the interval, and to record any memories which came into his mind while thinking over the dreams. He was instructed to come to me at once if he had any dreams of interest. A few days later he related a dream which I do not propose to consider here, because it does not directly concern the claustrophobia. The interest of the dream from the present point of view is that in thinking over the dream there had come into his mind an incident going back to the age of 6 which had, so far as he knew, gone completely out of his mind for many years. Taking the dream and memory as a starting-point, he was led on to recall two other incidents of this time, one of which seemed to be definitely related to the dream. All three incidents had been completely forgotten till recalled on this occasion, though they were all associated with a strong emotional tone and had affected him greatly at the time. None of them seemed to have any relation to the claustrophobia, but they were very useful in demonstrating to the patient the value of analysing dreams on a basis other than that of sex, and in showing him that the method, if persevered in, might lead to something more obviously related to his symptoms.

Three nights later he had another dream. As he lay in bed thinking over the dream, there came into his mind an incident dating back to 3 or 4 years of age which had so greatly affected him at the time that it now seemed to the patient almost incredible that it could ever have gone out of his mind, and yet it had so completely gone from his manifest memory that all his attempts at psycho-analysis, prolonged over years, had failed to resuscitate it. The incident was of a kind which convinced him at once that the long-sought memory had been found. Unfortunately, his interest in the regained memory was so great that the dream which had suggested it was completely forgotten and all attempts to recall it were unavailing.

The incident which he remembered was a visit to an old rag-and-bone merchant who lived near the house which his parents then occupied. This old man was in the habit of giving boys a halfpenny when they took to him anything of value. The child had found something and had taken it alone to the house of the old man. He had been admitted through a dark narrow passage from which he entered the house by a turning about half-way along the passage. At the end of the passage was a brown spaniel. Having received his reward the child came out alone to find the door shut. He was too small to open the door, and the dog at the other end of the passage began to growl. The child was terrified. His state of terror came back to him vividly as the incident returned to his mind after all the years of oblivion in which it had lain. The influence which the incident made on his mind is shown by his recollection that ever afterwards he was afraid to pass the house of the old man, and if forced to do so always kept to the opposite side of the street.

Ten days later the patient dreamed that he visited Edinburgh for the purpose of taking the Diploma in Psychological Medicine. As he lay in bed thinking over his dream and its possible antecedents he found that he was saying to himself over and over again the name "McCann." He could not at first remember that he knew anyone so called, but it suddenly flashed on his mind that it was the name of the old rag-and-bone merchant in whose house he had been terrified.

One thing was needed to make the story complete. It seemed possible that these thoughts, recalled in consequence of thinking over dreams, might be purely fictitious. It might be that in his intense desire to find some experience of childhood which would explain his dread the patient might have dreamed, or thought of, purely imaginary incidents which had been mistaken for real memories. Luckily the patient's parents are still alive, and on inquiry from them it was learnt that an old rag-and-bone merchant had lived in the neighbourhood in such a house as the patient remembered and that his name was McCann. Until they were told some 27 years later they had no idea that their child knew anything of the old man or had ever entered his house.

Forgotten Experiences and their Revival.

I propose first to consider this case in so far as it affords evidence concerning the forgetting of unpleasant experience and the possibility of recalling such experience to manifest memory. It is well to distinguish this problem from the quite separate problems how far such forgotten

experience acts as the basis of morbid states and how far the recalling of the forgotten experience to manifest consciousness is of value therapeutically.

The main facts of the case from the first of these three points of view is that by following a certain procedure there came back to the patient a memory from early childhood which had, so far as he knew, been completely absent from his manifest consciousness for about 27 years. It had been so completely forgotten that even six years devoted to research into his infantile memories had failed to recall it. If it had not been for the independent confirmation of his parents the whole memory might have been dismissed as fictitious, but their evidence makes it clear that we have to do with the revival of a genuine memory.

It will be well here to consider the conditions which led to the recovery of this long-forgotten incident. The facts that it should have eluded observation although diligently sought for six years, and that it should have come so readily to light at a later time, suggest that there was something faulty in the process by which the search had been conducted before the patient came under my care. We may inquire why his previous attempts to discover the memory had failed when they succeeded so rapidly as soon as the subject was approached with a different method.

One cause of failure is undoubtedly to be found in the previous direction of the patient's thoughts exclusively in the direction of sex. He had been assured that the memory to be revived would certainly be concerned with sexual experience. All his endeavours had been devoted to the end of finding such an experience. We could hardly have a better example of the obstruction placed in the path of knowledge by the exclusive preoccupation of the Freudian school with the problem of sex. In dealing with this subject on another occasion[1] I have dwelt on the part taken by the exaggerated, if not morbid, interest in sex in producing the widespread prejudice against Freud's psychology which undoubtedly exists. The case I now record shows that the evil goes much deeper, and that the exclusive interest in sex may actually obstruct the discovery of an infantile experience which furnishes as good an example as could be desired of unconscious experience and of the possibility of recalling it to manifest memory.

A second, and perhaps more important, cause of failure is that until the patient came under my care his attention had not been especially directed to his claustrophobia. It was only when he recognised that his fear of being in a dug-out in France was not shared by others that he realised the specific character of his dread. It was only when he came under my care that for the first time the process of analysis started from and centred round the dread of closed spaces. Throughout all our conversations the attention of the patient was turned in this direction, thus leading the dream-thoughts to occupy themselves with this topic until they reached and brought to the surface the memory which had lain dormant for 27 years. The case well shows that the process of analysis by which forgotten experience is laid bare is not a loose method of examination which may start anywhere and be carried on anyhow, but, if it is to be successful, must be based on definite principles. It must start from some special symptom or other experience, and must be conducted with a definite relation to the experience it is desired to reach.

The previous failure of the patient to recover his infantile experience is to be explained partly by the exclusive direction of his interest in the direction of sex, partly by the process of examination and inquiry having failed to start from the dread of closed spaces to which the infantile experience has so obvious a relation. A problem which remains for consideration is whether the later success was merely due to these two faults having been remedied, or whether there was any positive virtue in the special method which was then employed. This method is essentially that of free association as understood by Freud—the method of "abstraction" of Morton Prince—but starting from the incidents of a dream and carried out during the time immediately following the dream. In my own experience I have found this time especially favourable for the recovery of memories, the state of half-wakefulness seeming to be especially favourable to the freedom of association. The employment of free association under these conditions must, except under very special circumstances, be conducted in the main by the patient himself. The physician helps in the process by leading the waking thoughts of the patient in a direction calculated to awaken the desired experience, and he may also, as in the present case, help to elicit memories other than those which are recalled immediately after the dream, but the method is only suited to intelligent and well-instructed patients.

The procedure followed in this case differs widely from that in which dreams are usually employed by practitioners of psycho-analysis, who seem to use dreams chiefly as the means of obtaining clues to be investigated on other lines. In the most recent exposition of the theory of psycho-analysis[2] the value of dreams is rated very low, if, indeed, their use is not altogether deprecated. The success which has followed the special mode of utilising dreams now described, which has also attended other cases, suggests that Jung's condemnation of dreams is due to a failure to recognise certain ways in which they may be of use. The interpretation of dreams has become in the hands of most of Freud's disciples a sphere in which free rein is given to the wildest speculations, and if this kind of process is carried into the clinical field it is not surprising that so relatively judicious a student as Jung should have been led to discount their value. Here, as in every other of its aspects, the whole theory and practice of Freud and his disciples need thorough revision. When looked at from a new point of view, dreams may again take a prominent place among the means towards the recovery of a forgotten and repressed experience.[3]

Relation of Forgotten Experiences to Pathological States.

Thus far I have dealt only with the evidence provided by this case of claustrophobia in favour of the reality of unconscious experience and with the means by which it may again come to form part of the system of fully conscious memories. I have now to consider how far this case supports the contention that the forgetting of such unconscious experience acts as the basis of pathological states. In the case before us the pathological state is a definite example of a phobia. The problem for decision is whether the specific dread from which the patient has suffered for so many years is the direct product of the forgotten experience of his childhood. The whole character of the infantile experience is one well calculated to produce such a fear as that from which the patient has so long suffered. The situation of a small child of 4 in a dark narrow passage with a strange growling dog as his sole companion is certainly one we might well expect to produce a lasting impression. It is noteworthy that the infantile experience accounts for the special feature of the claustrophobia that it is not so much a closed space itself which the patient dreads but it is the fear that he may not be able to escape which especially haunts his mind. The inability of the child of 4 to open the door leading him from darkness and danger into light and safety seems to have been perpetuated in the special character of the claustrophobia afflicting the man of 30. Throughout his life it has been when he sees no way of escape, whether at a distance from an exit, in a tunnel, or tube railway, that the dread comes upon him, and when he went to France it was more especially the fear of being buried in his dug-out which drove him to leave conditions usually regarded as those of comparative safety to wander in the more dangerous trenches. This close correspondence between the infantile experience and the dread of later life can leave little doubt that the two are definitely related to one another, and that the infantile experience was the primary condition of the claustrophobia. It would seem probable that the phobia was accentuated and fixed later by his experience at the age of 6, when night after night he lay in the "box-bed," fearing to show any signs of fear owing to the presence of his brother. The process seems to have been one in which the great potentialities of an infantile impression were developed and fixed so that the emotional condition associated with the experience of the infant came to form part of the constitution of the boy and man. It is possibly owing to this later experience that the dread which was to occupy and often master the mind of the patient for nearly 30 years had as its object the narrow space rather

[1] THE LANCET, June 16th, 1917, p. 912.

[2] C. G. Jung: The Theory of Psycho-analysis, New York, 1915, p. 64.

[3] Since this was written I have found that the method used in this case agrees closely with that of Dr. Meyer Solomon (Journ. Abnorm. Psych., vol. viii., 1913-14, p. 73).

than the dog which was the more immediate cause of the child's terror. So far as the patient remembers he has never had any fear of dogs, but it is possible that there was a period when the dread of the child was also directed to the animal, and that it was only the later and long-continued terror at the age of 6 which transferred the dread so completely to the other chief element of the earlier experience.

Theory of Repression and Active Forgetting.

Another problem for consideration is how far his case supports Freud's special theory of repression and active forgetting. What is needed here is some definite explanation of the process by which the acute and fully conscious terror of the child became converted into forgotten experience which was only restored to manifest consciousness after many years. What can have been the nature of the process by which the fully conscious and vivid terror of the infant of 4 was converted into something unknown and unsuspected working in subterranean fashion to reproduce the state of dread or terror whenever the patient was exposed to conditions similar to those of his infantile experience? This topic belongs to the most difficult and obscure department of the subject. In the case of adults there is reason to believe that the process of active forgetting or repression may in some cases take place more or less suddenly as the result of a shock or during a period of unconsciousness or delirium. On the other hand, it may be the result of a long-continued process of conscious or subconscious exclusion from attention. It is difficult to imagine the latter kind of process taking place in a child of 4 or 5. It seems likely that it was the result of an illness in which the forgetting was assisted by some condition which produced an obvious modification of consciousness. I therefore asked my patient to make inquiries into the history of his early illnesses. He found that when between 2 and 3 years of age he had an attack of scarlet fever, so severe that the doctor despaired of his recovery. Between 5 and 6 he had enteric fever, which does not seem to have been especially severe. When about 6 or 7 years old he had an abscess in the shoulder which lasted some months. Later he had pleurisy and was delirious, and there was again for a time little hope of his recovery. This was followed by an abscess in the foot which took some months to heal. The patient thus had a succession of severe illnesses both before and after the incident which seemed to have determined his claustrophobia. The scarlet fever probably so weakened his health as to make him susceptible to dissociation or to enhance an innate susceptibility in this direction, while one of the later illnesses may have provided an opportunity for conditions which would assist the process of dissociation itself.

Therapeutic Value of Recovery of Forgotten Experience.

I have now considered how far we can accept this case as evidence for the reality of unconscious experience and for the view that such experience is the basis of the pathological state of claustrophobia. There still remains the question how far the case supports the contention of Freud that the bringing of unconscious experience to light is of therapeutical value. Two problems should be carefully distinguished. It is one problem whether the restoration of a forgotten experience to manifest memory relieves nervous morbid states, and it is a different problem to discover through what processes the "cure" works.

As regards the first problem, there is no doubt that the recovery of the forgotten experience of my patient had a great effect on his condition. A few days after recalling the memory he sat without disturbance in the middle of a crowded picture-house under conditions which for years before would have given him the most serious discomfort and dread. The patient himself was so confident that he wished me to lock him in some subterranean chamber of the hospital, but I need hardly say that I declined to put him to any such heroic test. He has since travelled in the tube railway with no discomfort whatever, so that the ordinary conditions which had brought his phobia into activity for many years no longer have this effect. A striking sequel of the recovery of his infantile memory is that terrifying dreams of being unable to escape from enclosed spaces from which he formerly suffered now trouble him no longer, and he has recently had a dream, to be related elsewhere, in which he found himself in a narrow cell in the company of a blood-hound, and was amazed in the dream that he should be so happy and comfortable in this situation.

The effect on the other symptoms from which he was suffering as the result of his war experience has been less satisfactory. His stammering improved to some extent, and still more striking than any objective improvement was the disappearance of a dread of stammering which had been a constant source of trouble since coming home from France. He became able to take plenty of physical and mental exercise, but he continued to sleep badly and to be troubled by disturbing dreams of warfare. The continuance of these symptoms, however, is certainly due to the fact that though his claustrophobia had formed the starting-point of his general war neurosis the neurosis is now kept going by other forms of anxiety.

In connexion with his broken sleep and disturbing dreams of warfare one point may be considered. In entering upon the line of treatment which I have described in this paper I hesitated whether I was justified in possibly adding to his other causes of loss of sleep by getting him to attend to and think over his dreams. The progress of the case speedily removed any apprehensions of this kind. After his infantile memories had been discovered he continued to be interested in his dreams and their analysis, but did not find that the process interfered with his sleep. Even while on the search for forgotten memories he did not attempt any analysis of that class of dream dealing with scenes of war, which especially disturbed his sleep.

The Mechanism of Recovery.

The last problem I have to consider is concerned with the agency by which the recovery of the lost memory has so greatly relieved the claustrophobia of the patient. According to Freud and his disciples the raising of repressed experience to the surface is in itself sufficient to bring about the disappearance of morbid states, and they often cite this curative action as evidence in favour of the general theory of repression. The case before us might well be regarded as striking evidence in favour of their view. The recollection of the incident of his childhood has been followed by the disappearance of the dread which has been with him for so many years. It might seem at first sight evident that this disappearance has been the direct result of the reintegration of the forgotten and dissociated experience with his ordinary personality. Another possibility must, however, be considered.

The whole procedure of psycho-analysis is calculated to bring into play the agencies of faith and suggestion. Thus the patient had been assured from his first attempt at psycho-analysis that the recovery of a forgotten experience of childhood would effect a cure. It was evident when he came under my care that in spite of previous failure his mind was still dominated by the belief that if the right experience could be found he would recover. When the memory of the passage and the dog came back to him his mind was filled with a sense of comfort as regards his illness such as he had not known for years.

I did nothing to enhance his confidence in the Freudian interpretation of the process by which the recovery of a lost memory produces a cure, but in spite of my own scepticism concerning the mechanism of recovery, I was careful to say nothing which would have disturbed his faith. This faith was so great that it cannot be excluded as a factor in the therapeutical success of the revival of the forgotten experience. His case has one feature, however, which suggests, if it cannot be said to prove, that the recovery of the memory rather than the influence of faith and suggestion was the essential agent in producing the disappearance of his dread. For years the patient had believed that the recovery of the right memory would cure his stammering and get rid of his general nervousness. For reasons already considered, his faith had not had the state of claustrophobia as its object. Nevertheless, it was this symptom which was so greatly relieved, though we cannot yet say that it has been wholly cured. The stammering and general nervousness, on the other hand, which had throughout been the special objects round which his faith was working, though altered for the good, have been relieved in far less degree. The argument is not conclusive, because the direction of the patient's attention towards his claustrophobia, which was an essential element of my treatment, may have acted as an instrument by means of which the agencies of faith and suggestion already working in the patient's mind were turned towards his claustrophobia.

PERFORATIONS OF STOMACH AND DUODENUM.

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As I have had the privilege of being emergency surgeon in the central surgical military hospital of a large camp, most of the cases requiring immediate surgical attention have come under my care, and perhaps no group of cases has been of more interest than the gastric and duodenal perforations. One might think that in a military camp one would get these cases sent into hospital early, so that the surgeon would have the best possible chance, but, for various reasons this is not so, very many of the cases being admitted in the later stages of their illness after general peritonitis has developed. The condition in which one gets cases differs very little from that of civil practice. We have had a good deal of trouble with chest complications, and I think this is due to the soldier, exposed to unaccustomed conditions, suffering much more from catarrh of the respiratory tract than civil patients usually do.

The type of ulcer was usually the chronic variety with a great deal of induration around, and there was usually a definite history of gastric trouble over a long period. The man entered the service with an ulcer, and this serious complication was no doubt precipitated by the impossibility of the sufferers avoiding the more indigestible articles in the Army dietary.

As regards treatment, it has been carried out on the usual lines. Most of the cases were drained. Very little time was spent over swabbing out the extravasated fluid, and only in one case, where the abdomen was simply full of thick foodstuffs, was any irrigation with saline attempted. Where the perforation was in the region of the pylorus or duodenum, if the patient was in fair condition, a gastro-enterostomy was performed. In closing the leak omentum was stitched over to supplement the invaginating sutures.

Case of Duodenal Ulcer: Prodromal Symptoms; Chest Involvement.

The first case I mention is of interest on account of the prodromal symptoms of perforation and as exemplifying that chest involvement which I have mentioned.

Private W., aged 27, was admitted complaining for the last few days of pain in the upper abdomen. His pulse and temperature were normal, and examination only showed some slight tenderness and resistance over the right upper rectus. At 2 A.M. the following morning he was seized with sudden severe pain in the epigastrium. He was seen by the orderly officer, who ordered an enema. This produced no result and I saw him two hours later. He was pale, suffering from considerable shock, and the abdomen was rigid and tender.

The abdomen was opened through the right rectus. A large perforation with marked induration round it was found on the right surface of the duodenum one inch beyond the pylorus. There was much difficulty in getting the opening closed, and when this was done a posterior gastro-enterostomy was performed. A tube was inserted into the pelvis through a small wound above the pubes. Patient made an uneventful recovery as far as the abdomen was concerned. The wound healed by first intention. He had no pain or tenderness in the abdomen after the first few days.

On the fourth day he began running a temperature which reached a maximum of 103·2° F. on the eleventh day. It gradually fell after this, but on the fortieth day it was still 101° in the evening and showed a large daily fluctuation. At the left base the percussion note was impaired. The breath sound was tubular. Sometimes it was distant and sometimes apparently quite superficial. Pectoriloquy was distinct. Repeated exploration of the pleura with a hollow needle gave a negative result. X ray examination showed marked mottling and increase of density on whole of left side of chest. These signs were most intense at the base. Under an anæsthetic a needle was pushed through the diaphragm, but only blood was obtained. Patient was sent to an auxiliary hospital, and on his return from this three months after his perforation he still had a temperature and a very purulent spit. A definite abscess was now localised in the base of the left lung. A rib was resected and the cavity drained, after which patient made a rapid recovery. He was discharged from the Army, but I have heard since that he is perfectly fit and able to work daily, although there is a small sinus through which a slight discharge and a little air escape at times.

Subphrenic Abscess.

In three of the cases fluid in sufficient quantity to cause cardiac displacement appeared at one of the bases, but in only one of the series did a definite subphrenic abscess develop. In no case was there ever any sign of pelvic abscess. The subphrenic abscess developed in a patient who had been perforated for 27 hours before operation and he was, in addition, somewhat up in years.

Lieutenant-Colonel C., aged 47, who had spent many years in India, had had dysentery, and had also for many years suffered from severe pain in the right hypochondriac region (regarded as renal colic; he had passed blood in his urine on one occasion), was sent to hospital with diagnosis of renal calculus. Patient had been ill for 25 hours. He was much collapsed. The abdomen was greatly distended and rigid all over. A diagnosis of perforated duodenal ulcer was made and operation proceeded with.

The abdomen was found full of fluid. There was a considerable amount of peritonitis, but not as much as one might have expected. The ulcer, a chronic one, was on the right surface of the duodenum. Patient was so ill that very little could be done. The aperture was closed, a large tube inserted into the pelvis through a suprapubic wound, and then the central incision stitched up. The patient would not stand any swabbing out.

During the first four days patient gradually improved. Then his temperature and pulse began to go up and he became exceedingly tender under the right costal margin. On the tenth day after operation there were signs of a definite abscess in this region. An incision was made parallel with the intercostal nerves and a quantity of thin, foul-smelling pus allowed to escape. A drainage-tube was inserted. Patient was better for a few days, but still the temperature did not drop to normal. There were impaired percussion and diminished respiratory murmur at the right base with displacement of the heart to the left. Exploring syringe showed a clear fluid in this pleura. On the twenty-fifth day patient was again given an anæsthetic and through the old incision, which was enlarged, two large drainage-tubes were passed up between the liver and diaphragm into a right extra-peritoneal subphrenic abscess. Patient gradually improved after this, but the fluid at the base remained so long that it was necessary to aspirate it. He was discharged with a sinus still persisting under the costal margin. This sinus is now soundly healed.

Case of Pyloric Ulcer: Operation; Gastro-enterostomy a Week Later.

Another case which I propose to describe shows how important a gastro-enterostomy is in many of these cases.

Private G., aged 49, was admitted 12 hours after perforating. The pulse was very poor. Operation was proceeded with at once. The opening was found exactly over the pylorus, so that it was impossible to avoid increasing the constriction that almost certainly existed. Patient was so ill and was taking his anæsthetic so badly that it was thought inadvisable to spend the extra time necessary to do a gastro-enterostomy. The pelvis was drained and the patient sent back to bed. The case was further complicated by an impermeable urethral stricture.

For two days patient went on very well. Then vomiting began. The stomach, which was found greatly distended, was washed out with a tube. There was no more vomiting for two days, but at the end of this time there was great gastric distension again, and patient began to bring up everything he took. A wash-out set him right, but when it occurred a third time patient was becoming very weak, and it was obvious it was going to be impossible to feed him.

Under stovaine the abdomen was opened again. A posterior gastro-enterostomy was done. As the jejunum was much distended it was opened and several loops emptied, the aperture being closed with a purse-string suture. The abdomen was then stitched up. Patient was very collapsed for a few hours, but soon recovered. By the use of eserine and pituitary extract the bowels were got moving and in a few days he was able to take light food.

He went on very well for 12 days, when he developed obstructive symptoms. A Paul's tube was put into a distended loop, but patient died. Post-mortem examination showed no mechanical obstruction. There was very little sign of peritonitis. Patient seemed to have died of paralytic ileus.

Mortality.

Perforations of the stomach and duodenum are very serious surgical conditions. Recovery apart from operation is exceedingly rare—put by some authorities at 5 per cent.—and until recent years the death-rate was exceedingly high even in cases operated on. The most important factor in the prognosis is the time that intervenes between perforation and operation. The improvement in results is due partly to early recognition of the condition in a larger proportion of cases and partly to improvement in the technique.

A collection of cases operated on by Mayo Robson, Finney, Moynihan, Christy Wilson, &c., showed the following result: Total number, 486; recovered, 227; died, 259. Percentage recovery, 44·6.

Sir Berkeley Moynihan in 1914 published the following table showing the effect of loss of time before operation:—

	0–12 hrs.	12–24 hrs.	24–36 hrs.	36–48 hrs.
Lived	36	9	6	1
Died	2	11	1	5

The results of the Edinburgh surgeons, Caird, Stiles, Miles, and several others between 1910 and 1913 were as follows: Total number of cases, 80; total recoveries, 53; number of fatal cases, 27. Percentage death-rate, 34·2.

Duodenal perforations give a larger proportion of recoveries than gastric ones. Mitchell, of Belfast, records a series of 16 cases of the former without a death.

I had altogether 20 cases, and of these 5 died—death-rate 25 per cent.—but 2 of these deaths occurred about three weeks after the operation; 1 died of pneumonia on the twenty-first day and the other, mentioned above, of ileus on the nineteenth day. Of the other 3, 1 had been perforated for over 48 hours before operation. Another, 24 hours perforated, lived a week and then perforated a second time. A second operation was done but failed to save his life. Rather more than half the cases were perforations of the stomach and there were four deaths in the gastric series as against one in the duodenal.

There were two cases of second perforation—one, a fatal case, I have just mentioned; the other had been operated on four months before I saw him for a perforated ulcer. He came under my care, suffering from symptoms of perforation again. On opening the abdomen great matting was found round the pylorus and duodenum, with stomach contents leaking from among the adhesions. It was impossible to define any definite opening. The omentum was sutured over the area of the leak and a posterior gastro-enterostomy performed. Patient made an excellent recovery.

The Question of Primary Gastro-enterostomy.

There is considerable difference of opinion about the advisability of primary gastro-enterostomy, and this is a subject on which there will always be disagreement, for every case must be considered on its merits and no hard-and-fast rule can be laid down, but the record of results of the various surgeons would rather indicate that in many cases the anastomosis should be done at once. Against it Corner points out that a third of the cases are cured by suture only. He thinks that the operation should be left to be done later, and it may be found that it will not be necessary to do it at all. The Edinburgh school are of opinion that omitting the operation has caused no bad result. In this they are in agreement with Collinson, of Leeds, and Ellsworth Elliot. On the other hand, Carwardine, in reporting 12 cases of perforation with 11 recoveries, says primary gastro-enterostomy was done in three and these were all among the recoveries. Mitchell, of Belfast, reports 28 cases of perforation of the duodenum with three deaths. Seven of them, all recoveries, had gastro-enterostomy done. Of the other cases one required the operation on the eighth day and another in 18 months, and other two of them had symptoms calling for the operation. The case of Maylard and Andrews in which perforation took place on three successive occasions, with an interval of three and a half years between each, is another argument in favour of the operation.

In my series primary gastro-enterostomy was done in six of the cases. These were all recoveries and they ran altogether a happier course than the ones in which it was not done. It might be said that the operation was done in the cases that were not very ill, and in which the prognosis was more favourable in any case. In mine this was usually so, but not always. In one of my cases the patient was an alcoholic of nearly 50 years, who had been perforated for 20 hours before operation. So much narrowing was caused in suturing the ulcer that a new opening from the stomach was necessary. If it is a perforation of a chronic ulcer in the region of the pylorus there is sure to be constriction, and with the additional narrowing caused by suture of the ulcer this constriction must be made worse. In one of my cases I had to do a gastro-enterostomy at the end of a week, and in another one at least there were symptoms of pyloric stenosis afterwards. Also, as I have mentioned already, one of my cases had been operated on for perforation previously. In cases of ulcer on the lesser curvature or anywhere away from the pylorus suture cannot give rise to additional trouble, and as improvement after gastro-enterostomy is only expected in a third of the cases of simple ulceration it does not seem advisable in cases that have perforated to prolong the operation for such a doubtful chance of improvement.

Prognosis.

The case operated on longest after perforation was over 48 hours, that with recovery 27 hours. The oldest patient was 63 years. He made a good recovery.

The life of most of these patients was saved, and most of them would be quite useful citizens afterwards, but I am afraid very few of them would be of much use to the Army, although many—in fact, most of them—returned to duty. I fear, however, that a large proportion of them would have a recurrence of gastric symptoms and have to be discharged later. It is difficult to render these men fit to take the Army diet. I have noticed among cases that I have operated on for simple gastric or duodenal ulcer that although they were greatly improved and seemed perfectly well while they were in auxiliary hospitals, they relapsed a short time after their return to duty and ordinary fare. It would take about a year of dieting to make these men right. On the other hand, officers, who can have a certain choice of food, have made perfect recoveries after operation, and have been able to return to full duty in a comparatively short time.

I am much indebted to Lieutenant-Colonel Wilson for permission to use the hospital records, and to Major Gordon Taylor for his kind advice and assistance.

Reviews and Notices of Books.

Health and the State. By WILLIAM A. BREND, M.A. Camb., M.D. (State Medicine), B.Sc. Lond.; of the Inner Temple, Barrister-at-Law; Lecturer on Forensic Medicine, Charing Cross Hospital. London: Constable and Co. 1917. Pp. 354. Price 10*s.* 6*d.* net.

GREAT efforts have been made by Parliament in recent years, upon the initiation and advice of responsible Ministers, members of various Governments, to improve the health of the community at the charge of the State. Dr. Brend has set himself the task of pointing out methodically, and with the support of established facts and statistics, that the value of these efforts has been unduly small, that grave mistakes have been made, and that money has been spent with disproportionate results. He asserts that there has been a general failure to achieve success, and attributes it to the means adopted to initiate and carry out reforms and to the system by which legislation is introduced by a Minister who may not himself be master of his subject, and who, for all that Parliament and the country knows, may not even be following the advice of the departmental experts supposed to be behind him.

The administration of the laws relating to the public health is a very complicated business, entrusted to a large number of public authorities who are not coördinated, and whose duties overlap at some points and at others leave important sections of the ground untouched; of this the medical profession, or those members of it who are brought into contact with public health questions, are fully aware, and these should be interested in Dr. Brend's exposition of the facts and deductions therefrom. Much more so, however, should his book be read by those members of the legislature who treat all Bills before Parliament as political measures, to be voted upon in strict conformity to party lines of action, or those who believe that on matters where experts agree amateurs may tender valuable advice, although no amateur need devote any study to the questions. In supporting the formation of a Ministry of Health to investigate the causes and distribution of disease and to evolve suitable measures for local authorities to carry out, Dr. Brend examines the various causes which lead to disease and loss of life, and describes the measures adopted hitherto in order to show the nature of the errors which, in his view, lead to misdirection of energy and useless expenditure. Here he enunciates opinions which themselves may attract criticism from his medical colleagues and the discussion of which may prove extremely useful. He gives prominence, for example, to the question whether the infectious nature of various diseases and the importance of segregation as a preventive of the spread of some illnesses may not be exaggerated, and he makes the same suggestion of exaggeration with regard to the view that infant mortality is largely a result of pre-natal conditions or maternal ignorance and neglect. His object here is to emphasise the greater urgency of the removal of those post-natal factors contributing to destroy infant life, but over which parents in the humbler classes of society have no control, obliged as they are by the circumstances of industry to live in crowded areas. In criticising the National Insurance Act, Dr. Brend describes it as the most ambitious piece of public health legislation ever carried through in the country, and says: "No previous measure has directly affected so large a number of persons, involved so great a cost, made such demands upon administration, or been introduced with such lavish promises of benefit to follow; and no previous measure has ever failed so signally in its primary object"; and he severely condemns the holding out of alleged successful national insurance in Germany as justifying the introduction of legislation upon similar lines here. As will be seen, there is a tendency here to beg the question of what was the "primary object" of National Insurance in the mind of the statesman mainly responsible for it and of his followers. Such a minister might reply by suggesting that legislation is largely a matter of politics and of feeling the way for desired reform along lines of least resistance.

When the National Insurance Act was introduced with picturesque oratorical descriptions of future benefits to accrue directly from it, reforms in land tenure, housing and conditions of labour might have been attempted, but might have failed to secure the approval of Parliament. These,

however, have probably been advanced several stages upon their road to fulfilment by the knowledge of disease affecting the working classes and of the failure of extended medical treatment to cope with it, as well as by the general stimulating of national interest in disease and its problems. In this connexion criticism, such as that levelled at National Insurance by Dr. Brend, iconoclastic as it may appear to some, may be of very definite usefulness in paving the way to more general and far-reaching efforts in the interest of the public health. But it seems almost impossible that such a consummation will be attained without a general effort on the part of legislators, and, it should be added, of their constituents, to study and to understand the nature of the problems involved before attempting to formulate solutions for them. This comprehension of what is required is all the more needed on account of the demands which legislation such as that suggested is likely to make upon private interests, and the multiplicity of the interests certain to be involved.

Clinical Surgical Diagnosis for Students and Practitioners. By F. DE QUERVAIN, Professor of Surgery at the University of Basle. Second English edition. Translated from the Fifth Edition by J. SNOWMAN, M.D. London: John Bale, Sons, and Danielsson. Pp. 841. Price 35*s.* net.

IN reviewing the fourth German edition of this book four years ago we expressed the opinion that there was no published work on diagnosis likely to give greater help to the student, qualified or unqualified, in view of the clear statement in the text of the essential points of diagnosis and the abundance of well-chosen illustrations. It is therefore with special pleasure that we welcome a new English edition of the book, prepared by Dr. Snowman from a fifth edition, in which Professor de Quervain had re-written the sections on stomach and duodenum, added nearly 100 new illustrations, and incorporated his recent experience in the diagnosis of the conditions special to war surgery. The translation has been well done, and conveys the freshness and originality of the Swiss school of surgery, of which, now Kocher is gone, de Quervain is the most distinguished living exponent.

Psychological Medicine. By MAURICE CRAIG, M.D. Cantab., F.R.C.P. Lond. London: J. and A. Churchill. 1917. Third edition. Pp. 484. Price 15*s.* net.

THE third edition of Dr. Craig's well-known manual has been enriched by additions on the subjects of the psycho-neuroses occurring in men exposed to shell shock and strain of war, psycho-analysis, and the Mental Deficiency Act of 1913. The first-mentioned and urgently pressing subject is well summarised. The symptoms of the effects of the various stresses of war are well recognised in these days, and do not turn out to be materially different from the symptoms of the traumatic neuroses, psycho-neuroses, and psychoses of other origin, but the problems of diagnosis and treatment remain and are urgent in proportion to the huge number of patients affected. The differentiation between the varieties of neuroses and psychoses, the limits to be assigned to the responsibility of patients in conscious and unconscious exaggeration and simulation of symptoms, and the more exact determination of subtle organic lesions are factors of the hardest problems, academic and practical. How are we to determine if a given symptom is of organic or functional origin, or the result of weak or perverted volition? To such questions rough-and-ready or *ex-cathedra* answers too often lead to therapeutic disaster. Much uncured nervous or mental disorder is invalided out of the Army, and the question at once arises whether this is due to therapeutic impotence, or to the treatment of organic cases as functional and of functional cases as organic, or to the failure of the diagnosis of exaggeration and simulation, conscious or unconscious, and the consequent neglect of the application of appropriate measures.

Dr. Craig is not much impressed with the value of psycho-analysis in the treatment of nervous affections due to the war, but it must nevertheless remain true that it is only by psychological analysis that problems of psychic abnormality can be solved. It is perhaps owing to the somewhat materialistic point of view of modern medicine that the results of treatment of abnormal psychic states are disappointing, and that so much of the successful treatment of such states lies to the credit of various sorts of charlatans. With the elimination of the more extreme sexual hypotheses of the psycho-analytic school and with an increase in width of their view we may hope for the solution of some of our difficulties in the determination of the validity of certain varieties of functional symptoms, whether somatic or psychic. In the meanwhile, a combination of physio- and psycho-therapy, as the author points out, appears to lead to the best results. Unfortunately, the psycho-therapeutist is born to his *métier*, and the difficulty of manufacturing him results in his being a scarce article. Dr. Craig's abstract of the Mental Deficiency Act will be found useful when, after the war, its provisions become more widely operative.

With the additions enumerated and verbal emendations here and there the book will, we are sure, continue to prove its usefulness as a manual for students and practitioners.

JOURNALS.

The Quarterly Journal of Medicine. Edited by WILLIAM OSLER, J. ROSE BRADFORD, A. E. GARROD, R. HUTCHISON, H. D. ROLLESTON, and W. HALE WHITE. Vol. X., No. 39. April, 1917. Oxford: At the Clarendon Press. London: Edinburgh, New York, Toronto, and Melbourne: Humphrey Milford. Subscription price, 25*s.* per annum. Single numbers 8*s.* 6*d.* net each.—The contents of this number are: 1. Some Actions of Anæsthetics Analysed by the Observation of Altered Cardiac Relations to Calcium, by W. Burridge. In a previous paper by the same author the view was expressed that anæsthesia is a state in which the body calcium has to work at a disadvantage. The experiments now recorded seem to establish the existence of a twofold action of anæsthetics on the heart—namely, a depressing action, which is reached quickly on addition of the drug to the perfusing solution, disappearing directly after its removal, and a favouring action which shows a time factor in its appearance, and especially in its disappearance. Certain observations are also recorded upon the effects of too low calcium tension of the blood and the risks which it entails in anæsthesia, and the suggestion is made that this condition may account, in part at any rate, for the risk associated with anæsthesia in the subject of chronic alcoholism or hyperthyroidism. 2. Researches on the Perfused Heart: An Action of Strychnine, &c., with Some Remarks on Tetanus, by W. Burridge. This contains the record of observations made on similar lines to those recorded in the first paper. A certain action is described as produced by strychnine, atropin, and ergotoxin in a certain type of abnormal heart, and the conclusion is drawn that the particular effect produced by these drugs follows on their ability to cause a degree of relative calcification of the tissues. The effects of the perfusion of solutions of relatively high calcium tension are considered, and are described as varying from the change of inhibition into excitation to the induction of tonic contraction. 3. Researches on the Perfused Heart: Some Actions of Adrenin, together with Some Remarks on Addison's Disease, by W. Burridge. Adrenin is found to have a twofold action on the frog's heart—a primary depressing action resembling inhibition and an augmenting effect, the sympatheticomimetic action. The relations between adrenin and calcium and the "balance" of the inorganic constituents of the blood or perfusing solutions are also studied, and on the basis of the results obtained it is suggested that the proportions of the inorganic constituents of blood are such as to render it an unsuitable medium for the manifestation of cardiac activity except in the presence of adrenin. The origin of certain symptoms of Addison's disease is traced to such lack of balance. 4. Pathology of Dysentery in the Mediterranean Expeditionary Force, 1915, by G. B. Bartlett. One of the general conclusions arrived at in this important paper is that the epidemic of dysentery among the troops upon the Gallipoli peninsula was due to amœbic infection. In the examination of 477 stools of dysenteric appearance vegetative amœbæ of pathogenic type were found in 379, or 79·4 per cent., while at the post-mortem examination of 61 cases of dysenteric ulceration of the intestines amœbic lesions were found in 56, or 91·8 per cent. Amœbic infection was more prevalent on the peninsula than the symptoms and signs in the hospital indicated, since on the routine examination of 652 stools not dysenteric in appearance vegetative amœbæ of pathogenic type were found in 118, or 18 per cent. The epidemic of

amœbic dysentery was accompanied by an epidemic of enteric fever, lesions of enteric being found in 41 of 142 complete necropsies, or 28·8 per cent. The routine treatment adopted was that recommended by Sir Ronald Ross—viz., injection of emetine hydrochloride, administration of saline purgatives and bismuth mixture—and it was successful in curing amœbiasis in the majority of the cases. It is further of importance that the routine treatment in amœbic dysentery should be designed to combat bacterial infection of the intestines as well as to eliminate amœbiasis. 5. Diabetes Innocens, by George Graham. An interesting résumé, with a record of some cases showing that an innocent form of glycosuria occurs which is not associated with renal disease, and that it occurs in two types. In one, the output of sugar is very small and is not appreciably altered by a dose of sugar; in the second, the output of sugar is greater and is increased to a certain extent by a dose of sugar.

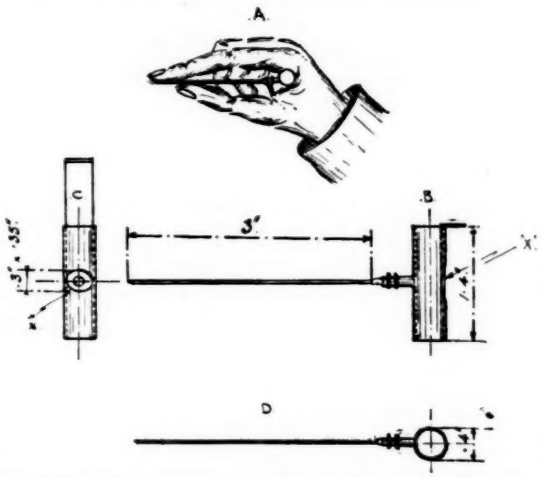
Brain: A Journal of Neurology. Vol. XXXIX. Parts III. and IV.; and Vol. XL., Part I.—Parts III. and IV. of Vol. XXXIX. are in one volume and comprise a series of very important papers. Among these is Professor W. D. Halliburton's suggestive address as president of the Neurological Section of the Royal Society of Medicine on "The Possible Functions of the Cerebro-Spinal Fluid." Dr. E. G. Fearnsides contributes an interesting and exhaustive article on intracranial aneurysms—a study of cases found post mortem at the London Hospital between 1907 and 1913, 44 cases out of 5432 necropsies in which examination of the head was permitted. It would seem from the evidence afforded by these cases that syphilis is a very rare cause of intracranial aneurysm, and that the cases form two groups: one associated with inflammatory conditions—e.g., infective endocarditis—and one with arterial or cardio-vascular degeneration. Dr. Ffrangcon Roberts deals with the degeneration of muscles following nerve injury, and Dr. Graham Brown and Dr. R. M. Stewart contribute a paper on the recovery of power of localising and discriminating sensations in cases of cerebral lesions. Mr. E. W. Scripture gives graphic records of speech in cases of disseminated sclerosis which he claims to be helpful in the early diagnosis, and Dr. J. McIntosh and Dr. P. Fildes describe their experiments which endeavour to determine the factors which govern the penetration of arsenic and aniline dyes into the brain, and their bearing upon the treatment of cerebral syphilis.—In Vol. XL., Part I., Dr. David Orr and Major R. G. Rows continue their researches into experimental toxi-infection of the nervous system—the present paper dealing with the process as it affects the brain. The second paper is by Dr. George Riddoch on "Dissociation of Visual Perceptions due to Occipital Injuries with Special Reference to Appreciation of Movement," and is a valuable study of the material he has had at his disposal in the Knutsford Hospitals. The third article is one by Dr. Ramsay Hunt (New York) on "Progressive Atrophy of the Globus Pallidus," an article which goes far to support his contention that the juvenile form of paralysis agitans has as its pathological basis degenerative changes in the cells of that structure. It is even suggestive that such changes may underlie ordinary cases of paralysis agitans, and it brings these into relationship with the cases described by Wilson of chronic lenticular degeneration.

New Inventions.

A MODIFICATION OF A NEEDLE FOR LUMBAR PUNCTURE IN SYPHILIS.

WHEN in a case of syphilis it is desired to obtain a sample of cerebro-spinal fluid for testing purposes, Professor Jeanselme, of the Broca Hospital, Paris, uses a platinum-iridium needle three inches long and of a very fine calibre (outside diameter measuring 57 by Sturrett gauge). The fineness and flexibility of this needle make the operation of lumbar puncture practically painless, but the absence of a handle renders its manipulation a little difficult. I find this can be overcome by fixing to the shoulder of the needle a hollow cylinder, open at both ends and with a window cut in its middle, as shown in the illustration. The lumbar puncture is carried out as follows.

The patient is placed sitting on a stool with elbows resting on knees, head bent down, and lumbar region thrust well out. If confined to bed he should be on his side with knees and shoulders brought close together and the lumbar region arched out as much as possible. A rubber tubing is stretched between the highest points of the iliac crests, and a mark made with an indelible pencil on each side of the spinal column. This gives the upper border of the fourth lumbar spine. The skin is now sterilised with absolute alcohol and anæsthetised by spraying with ethyl chloride. The needle, previously sterilised and dipped in sterile olive oil, is held in the right hand (see Figure, A). Then with the forefinger of the left hand



Platinum-iridium lumbar-puncture needle. B, Side view of needle with handle annexed showing little window, or opening, and shutter, marked "x." C, Top view of handle giving full view of window and shutter "x." D, View of needle and handle placed horizontally so as to show hollow cylinder handle.

feel for the most prominent spine at the level of the marks made with the indelible pencil; it is not always below the line drawn and may be either on the line or slightly above it. Insert the needle in the middle line just beneath the finger with a sudden sharp jab, so as to go through the superficial structures; push the needle onwards until the dura mater is pierced. The sensation imparted to the finger as the needle punctures the dura mater is quite characteristic. By keeping the eye fixed on the window (marked "x" in illustration) one can see when fluid begins to flow. (In some cases the cerebro-spinal fluid is at such pressure that it spurts through the window. If this happens the shutter can be lowered.) A sterile test-tube is then placed under one end of the cylinder handle; the fluid flows down the inside of the cylinder and directly into the test-tube. None can run back along the outside of the needle and down the patient's back, as often happens when using the ordinary lumbar-puncture needle. Sometimes the fluid flows better by rotating the needle. This can be done without interfering with the outflow, as the cylinder handle is open at both ends.

If it is desired to administer intrathecal injection after the withdrawal of the cerebro-spinal fluid a syringe or rubber tubing can be attached to the needle through the window ("x") in handle.

Having withdrawn the required amount of cerebro-spinal fluid the needle is removed, a collodion dressing applied, and the patient immediately put lying down on his stomach on the operating table or on a sofa for about 15 minutes. He is then allowed to walk back to his ward, being instructed to go straight to bed and remain lying on his stomach for a few hours.

I have used the above needle for some time and find that lumbar punctures performed as above are practically painless and are rarely followed by any headache or bad after-effects. The needle handle shown was made under my direction by Sergeant G. T. Platford, R.A.M.C., from an empty cartridge case. The complete instrument is now made by the Holborn Surgical Instrument Company, and the price is 25*s*.

CHARLES F. WHITE,
Major, R.A.M.C.

THE LANCET.

LONDON: SATURDAY, AUGUST 18, 1917.

Education, War, and Progress.

WAR is the great opponent of the progress of civilisation and a prime deterrent of educational schemes. This truism was found on all lips as soon as it became apparent that the war must last for a long time, being employed as an argument alternatively for the immediate suspension of everything except fighting, and for the immediate suspension of fighting. But the truism has been examined more closely as the recent months and even years were rolling by, when it became possible to note that in certain directions sociological advances were being originated by, or growing up with, the conduct of the war. And the spirit with which the country, as well as the legislature, has received the proposals of the Education Bill, which was introduced last week in the House of Commons, is a proof that we are all resolved that the end of the war shall not find us as a nation to have lapsed far from our former grace—nay, we may hope to see, on the day when peace dawns, signs that we are more ready to seek for better things. Mr. FISHER justified the introduction of a measure of far-reaching social importance in the height of a great European war because, among other things, the provisions of the new Education Bill are connected with the circumstances of the war; and when he warned the House of Commons, in an advance defence of his more revolutionary proposals, that we had reached a point in history where we must take long views, he was saying in so many words that the war has enabled us to see much in proper perspective that had been a muddle to the self-satisfied vision of peaceful security. He reminded us that we have incurred the hostility of a nation larger in population than our own, and with a larger extent of concentrated territory, and that no one need count upon German sentiments changing after the war; it followed that it was necessary for the youth of our country to be given the best educational opportunities which ingenuity can devise, so that the coming generation may hold its own in the gigantic international combat of brains and endeavour.

The new Bill is founded upon Mr. BALFOUR'S Act of 1902. It is a development of that thoroughly sound, though much discussed, piece of legislation, and we trust that it will be carried into law much in the shape of its original provisions. For it is a charter of salvation for our youth of both sexes. There can be no doubt whatever that the best educated countries will be the ones that will most quickly recover from the effects of the war, while the benefits of education can only be adequately obtained by those in a sound physical state. Every educational scheme which tends to impair that state by so much fails in its educative purpose, and every scheme which does not aim to improve that state is a want of that long vision which Mr. FISHER demands. The main proposals of the New Education Bill may be summarised as follows: They aim to improve generally administrative organisation by the consolidation of school grants, and by any other measure of reform suggested by an effective survey of the educational machinery of the country; to secure that every boy and girl of elementary school life up to the age of 14 shall be sheltered from industrial work; to establish part-time day-schools at which attendance shall be compulsory; and to develop higher elementary education while making the improved physical conditions of the children a first care. In many places this programme is of distinctly medical interest apart from the general interest which medicine must always take in the work of social reform. We endorse cordially, for example, the intention to enforce the prohibition of the employment of children under the age of 12 and to secure that those under the age of 14 shall pursue their studies uninterrupted by the competing claims of industry. There is no doubt that all earning of wages under 14 is open to grievous abuses. It may be quite true that in certain districts of the country where part-time employment is recognised the physical standard of the children does not seem to be unduly low, but, if it be true, it can only prove that the system as at present worked is in the hands of considerate and intelligent employers. The organisation under which continuation schools are to be set up by the Bill reveals a very proper and adequate appreciation of the circumstances in which alone such schools can be of any service. It is proposed that, with certain exceptions to be defined under the Bill, any person no longer under obligation to attend a public elementary school shall attend such continuation school as the local educational authority of the area in which he or she resides may require for a period of 320 hours in the year—that is, eight hours a week for 40 weeks. And we rejoice to see that the Bill provides that the part time which is to be given up to continuation study will be taken out of the employers' time, precaution being also observed that the students have not to work unduly long hours during the days on which the classes are held, and are given a reasonable interval for food, rest, and washing between leaving the workshop and attending the continuation school.

Mr. FISHER is to be warmly congratulated on his Bill, and we hope that it will not be long before the measure, without drastic modifications, finds a place on the Statute-book. The general health of our State school population is not good, though strenuous exertions on the part of school medical officers have maintained it without deterioration during the war. We are sure that the splendid efforts made by the school medical service will take more speedy effect under a reformed legislation. Physical training is already recognised in our elementary State school education, but few educational medical officers can feel that

they have at their disposal any systematic scheme for the physical betterment of their charges. The new Bill gives physical training a place in the activities of the continuation schools, while it empowers local education authorities to establish nursery schools and to maintain playing fields and swimming baths. Medical inspection will take on a new meaning when such opportunities for physical well-being are brought within the reach of the young of both sexes. The Bill is a piece of enlightened hygiene. Money will have to be spent with both hands to ensure its promises being realised, and the truest economy will be served in the spending.

The Administrative Control of Tuberculosis.

WE have the tuberculous, as we have the poor, always with us, and their origin has much in common. Administrators have long been accustomed to look on the incidence of tuberculosis and the statistics of infant mortality as indices of the success of social medicine in a community. For many years we have noted with some complacency a steady reduction in the death-rate of both, although in diminishing ratio, to which pleasant feeling of security the figures for 1915 put an end with something of a rude shock. In that year 41,676 deaths were returned under headings 28 and 29 of the international list of causes of death, which include "phthisis" and pulmonary tuberculosis, amounting to 7·4 per cent. of the death-rate from all causes. In almost every age-group among females as well as among males the mortality was markedly higher for 1915 than for the average of the five previous years. The figures for tuberculous meningitis showed the same increased incidence. These and other similar facts give occasion for a renewed inspection of the means applied in this country to control tuberculosis; and it is instructive to note that at the end of the first quarter of the current year only 269 sanatorium beds and 69 hospital beds were occupied by insured persons suffering from tuberculosis under the care of the Insurance Committee of the County of London, while during many months of the year 1916 the number on the waiting list exceeded the number of those under institutional treatment. The London Insurance Committee was unanimous in finding the provision for tuberculosis in the county, and especially the financial provision, to be inadequate, and in bringing the situation very forcibly to the notice of the Commissioners. Going further afield, a dramatic picture of the incidence of tuberculosis in France has been recently drawn by Dr. HERMANN M. BIGGS, the State Commissioner of Health for New York, who was sent, at the suggestion of the French Government, by the Rockefeller Foundation to consider the problem of tuberculosis in the French armies. Dr. BIGGS found that there had been a great increase in the prevalence of tuberculosis in all the armies of the belligerent countries, excepting only England. He estimated that if the war were to end now there would be approaching half-a-million cases of tuberculosis to be cared for, with practically no facilities in France to deal with them. At the end of this year France may have some 15,000 beds at the disposal of tuberculous patients, in addition to half-a-dozen well-organised dispensaries, and a handful of physicians conversant with the tuberculosis problem, but with no trained nurses or special social workers. The figure takes note of the new hospital annexes, to which our Paris Correspondent calls attention this week. This is an improvement on affairs at the beginning of the war when there were only some 1000 sanatorium beds in the whole of France, and these in private institutions. Hospitals then received tuberculous cases into their general wards and cared for them there, if at all. Before the war France had, in fact, a tuberculosis death-rate three times as high as England and more than twice as high as that of New York City.

Dr. BIGGS, as well as the French authorities on whom he bases many of his statements, finds that this lamentable degree of tuberculisation was dependent on the virtual absence before the war of any effective administrative control on which the conditions obtaining on mobilisation had a specially baneful effect. The extreme urgency made any thorough physical examination of the recruits impossible, with the result that many cases of latent and incipient tuberculosis were mobilised. On this material the conditions of trench warfare, the cold and damp of the predominating underground life, relieved only by billeting in peasant houses with little air or sunshine, produced their inevitable effect, although by no means as speedily as might have been expected. At the receiving hospital for the sanatoriums of Bligny, where for purposes of classification all tuberculous cases of whatever degree were sent in the first instance, Dr. L. GUINARD, the physician in charge, relates that out of the first 1500 patients 863 were found to have taken part in campaigning, of whom 395 had served between 6 and 12 months, 149 more than 12, 28 more than 18, 9 more than 20, and 8 more than 24 months. High among the soldiers, the incidence of tuberculosis has apparently been larger among the 3½ million people who remained in the invaded departments, of whom a large number have now been sent back by way of Switzerland. Of the first 20,000 of these 25 per cent. were estimated to be suffering from tuberculosis. Among the civilian prisoners in Germany an estimate of 3 or 4 per cent. has been made, while the proportion of tuberculosis among exchanged prisoners from Germany has been placed at 30 to 40 per cent.

Few, if any, of these observers lay great stress on infection as a principal agent in the incidence of this war-time tuberculosis. Dr. BIGGS frankly draws the simple lesson of the value of public health organisation and administration in control, ascribing the difference between England and France in respect of tuberculosis to the relative efficiency in the former of the public health service. America, with its aptitude for learning lessons from the failures of others and with the nearer object-lesson of the large incidence of tuberculosis in the Canadian Army, has just

instituted a volunteer service of physicians with special experience of chest conditions, who will be commissioned for short periods of three months or so as lieutenants in a medical corps to re-examine every man now in service in the reserve officers' camps and the national guard as fast as they are called up into federal service. In this way it is expected to prevent the risks attendant on the arduous conditions of army service to those with any demonstrable tuberculous lesion. Any persons who still contend that under the present conditions of civilised life infection is the main factor in the spread of tuberculosis should study with care and an open mind the story of tuberculosis in the French Army and Dr. BIGGS's report upon it. It is, of course, obvious that the complete segregation of the tubercle bacillus would remove tuberculous disease, and probably in the minds of those who uphold the infectious origin the syllogism rules: The consumptive contains tubercle bacilli; tubercle bacilli should be segregated; therefore the consumptive should be segregated. This view was presented by the London Insurance Committee in their recent report on the treatment of tuberculosis, a view which prevailed against the unanimous dissent of the medical members of the Committee. The report laid strong emphasis on the infectious character of tuberculosis and on the contact with the tuberculous person as the main cause of the disease, comparing, indeed, tuberculosis with the common infectious fevers, and suggesting that the problem of segregation could be solved by adopting methods applicable to these transient affections. Dr. H. HYSLOP THOMSON's article, which we publish in another column, makes a comprehensive survey of the methods of administrative control which, as experience has shown, are by no means covered by the avoidance of infection. How could it be otherwise when at least seven-eighths of our urban community and one-quarter of our rural community have been demonstrably brought in contact with the tubercle bacillus, whereas less than 10 per cent. ever suffer from tuberculous disease?

HOUSING IN SCOTLAND.—The Local Government Board for Scotland has issued to the local authorities under its control a series of questions as to housing accommodation for the working classes, similar to the series inquiring into such conditions in England, upon which we commented last week. The inquiry covers practically the same ground in both cases; but the Scottish local authorities are specifically asked for information in tabular form as to the number of existing houses containing four apartments and under, excluding sculleries: how many of these were in 1911 (the date of the last Census), and how many are in the present year, occupied, vacant, overcrowded or sublet, defective or uninhabitable—whether occupied or not. It is asked, further, that, if the information can be subdivided conveniently, particulars shall be given separately as to houses containing one, two, three, and four apartments. The question is a pertinent one when it is borne in mind that in a house of less than four rooms there cannot be, in addition to a kitchen or living room, accommodation for sons and daughters separate from one another and from their parents.

Annotations.

"Ne quid nimis."

THE MEDICAL MAN IN PARLIAMENT.

MAIDEN speeches were made in Parliament this week by two notable recruits to the small number of medical men representing constituencies in the House of Commons—namely, Sir W. Watson Cheyne, the Member for Edinburgh and St. Andrews Universities, and Sir A. Garrod Thomas, the Member for South Monmouthshire. In each case the speaker's words owed authority to his medical position and scientific training, but in each case the well-being of the community at large, and of that vast section of the public which is fighting our battles in the trenches, inspired the arguments. The speeches were not by doctors for doctors, which is to say that Sir Watson Cheyne and Sir Garrod Thomas are seen fully to understand the right rôle of the professional man in a general assembly of deliberation. Parliament exists for the good government of the people, and men of special equipment find their place there not as advocates of their class but as exponents of the views of that class where questions of public importance are at issue. Sir Watson Cheyne put admirably, and indeed unanswerably, the arguments against the official recognition for purposes of the Navy and Army of unqualified medical ministrations. Officers and men can consult any irregular practitioners if they choose, but it is impossible for the Admiralty or the War Office to take the responsibility of handing over the medical care of their employees to persons whose scientific equipment has received no standardised tests. Sir Garrod Thomas addressed himself to a question which, like that of the unqualified practitioner, is not new in the House of Commons, but about which more will certainly be said. He called attention, in quite restrained terms but with facts behind him, to the anomalous distribution of medical men between the fighting forces on the one hand and the civilian population on the other, alleging that the Army in France has many medical officers whose time is but scantily employed, while showing that in certain civilian centres no possible display of energy by the few men left to do the work enables them to keep level with their duties. Mr. Macpherson, replying for the War Office to the arguments of both speakers, stated that the Department would not take the risk of employing unqualified persons. He also announced that a Committee would be appointed to inquire whether any misuse had occurred in the employment of medical men in France. We are glad to know that this Committee will be appointed immediately. The medical profession is anxious to learn what are the rights and wrongs of a very important matter. To say that the temporary unemployment of medical officers in their ambulance capacity merely implies low casualty lists at certain times is a perfectly satisfactory answer in many of the cases of apparent waste of medical material which have been brought forward; but other instances of misuse have been alleged which do not fall under this category, and which should certainly be the subject of investigation. Sir Watson Cheyne and Sir Garrod Thomas have made their mark as Parliamentary debaters with far less delay than is usual among new Members, and the medical profession welcomes their presence in the House of Commons.

THE LONDON SCHOOL MEDICAL SERVICE AND THE WAR.

THE increasing importance which is being attached by all public authorities to the conservation of the health of the nation's children is illustrated by the action just taken by the London County Council in restoring the personnel of the School Medical Service to its pre-war footing. As a war emergency measure the London County Council in November, 1915, decided to reduce its school medical staff by the equivalent of four and a half school doctors and four school nurses. This reduction was carried into effect largely by modifying the procedure in relation to the examination of the entrant infant children. It was decided that in place of the detailed examination of all entrants there should be substituted a preliminary cursory inspection of entrants followed by a detailed examination only of those picked out by the school doctor as obviously ailing. The effect of this alteration is set out in the annual report for the year 1916 of the school medical officer which has recently been issued. In this report reference is made to the apprehension naturally entertained that this modification of the procedure would result in failure to discover defects of an important nature in many of the children. That this fear was based upon solid grounds is shown by the fact that under the new method there was in 1916 a leakage to the extent of 12 per cent. in the children found to have defects necessitating advice. Dr. W. H. Hamer concluded that it would be necessary to revert to the former practice of examining each entrant infant in detail as soon as the conditions of National Service make it possible so to do. Some years ago, it will be remembered, there was an acute public controversy on this very question in the course of which Sir Victor Horsley vigorously took up the cudgels in favour of a complete detailed inspection of entrant children in place of what he then described as "the march past." The results given in Dr. Hamer's recent report constitute a testimony to the correctness of Sir Victor Horsley's views. It is to the credit of the London County Council that so soon as the results of the new departure were communicated to them by their school medical officer, and without waiting for any mitigation of the present stress upon the medical profession, they decided at once to restore the school medical staff to the original strength, on the ground that the welfare and care of the children must take precedence, even at the present time, of all other matters.

OUTBREAKS OF ŒDEMA IN GERMANY.

WAR conditions have given occasion in Germany for the study of an "œdema disease" practically unknown in peace practice. The most considerable study has been made by Dr. A. V. Knack and Dr. J. Neumann at the General Hospital of Hamburg-Barmbeck.[1] These observers deal with a series of cases among the civil population in whom the œdema was generally located in the feet and legs, occasionally in the thighs and trunk. In more than one-half some degree of facial swelling was present; in one-sixth of the cases the hands were swollen, and in one-ninth ascites was present. Men were more affected than women, young children not at all, the youngest certain case being 12 years old. In all severe cases a diminution was found in the refractive index of the serum, implying a hydræmic condition of the blood. Recovery always followed rest in bed on ordinary hospital diet, and restriction of fluids was rarely necessary. Convalescence was, however, slow. To determine the cause of the œdema the authors sought to secure its return in convalescents by restricting the diet principally to turnips, and by giving large quantities of water internally. Neither measure separately ever produced the result, but with restriction of diet plus water-drinking, the œdema rapidly returned in convalescent patients. Chemical examination of blood and urine showed a diminution in lipoids and in the organic phosphorus content of the body. Dr. F. Lange[2] discusses the causation of a group of similar cases observed by him among the industrial workers in a West Prussian centre, concluding that a diminished permeability of the blood-vessels was present, due to a qualitative alteration in the food, perhaps to the extreme deficiency of calcium. A study by Dr. W. Hülse, from the pathological institute of Breslau, on the origin of the œdema disease in prison camps,[3] led to much the same conclusions, except that it was more frequently found as a sequel to relapsing fever, a frequent plague of such camp life, and in men who had previously been long exposed to extreme cold. The condition may be taken as one of the signs of imperfect nutrition due to restricted diet.

[1] Deut. med. Woch., July 19th, 1917, p. 901.

THE SOLDIER AND THE CIGARETTE.

THE question whether cigarette-smoking does material harm to health has come into greater prominence now that the habit is almost universal amongst our troops. There can be little doubt that the soldier looks upon the cigarette as part of his kit, as affording him a source of genuine comfort in strenuous times and as increasing the pleasures of relaxation when his nerve-racking duties are for the time in abeyance. Everyone knows that tobacco-smoking has been associated from very remote times with phases of relief from stress and intense activity; the aborigines of America smoked the pipe of peace as much for this cause as to lend gravity to a *pow-wow*. The practice of smoking provides unquestionably a mental anodyne, and that fact alone accounts for its universality in the present bitter days. It must be remembered, however, that tobacco-smoking is a species of drug habit, although perhaps a mild one if we leave out the question of excess, and that the continual drawing of tobacco smoke into the mouth or, worse, deeper into the respiratory tract, introduces toxic risks. Hygienically, of course, air that contains poisonous products of combustion would be condemned as departing from a standard of purity demanded by healthy respiration. Moderate smokers, however, as a rule show no depreciation of normal health. It has been suggested that there may be a relationship between cigarette-smoking and the "soldier's heart." In a careful inquiry into this subject, undertaken at the instance of the Medical Research Committee by Dr. John Parkinson and Dr. Hilmar Koefod, the results of which we publish this week, it is concluded that while excessive cigarette-smoking is not the essential cause in most cases of "soldier's heart" it is an important contributory factor in the breathlessness and præcordial pain of many of them. The immediate effect of cigarette-smoking upon the circulatory system and

[2] Ibid., July 12th, p. 876.
[3] Münch. med. Woch., July 10th, 1917, p. 921.

upon the breathlessness of exertion was observed in 30 smokers, of whom 20 were cases of "soldier's heart" and 10 were healthy soldiers. Each subject smoked either four or five cigarettes during a period of 40 minutes. A demonstrable effect was recorded in 17 of the 20 patients, but it is interesting to note that the 3 unaffected were non-inhalers. Nine of the 10 controls, all inhalers, were influenced in the same fashion, though not to the same degree. Generally the observations show that in health the smoking of a single cigarette by a habitual smoker usually raises the pulse-rate and blood pressure perceptibly; and these effects are a little more pronounced in cases of "soldier's heart." Moreover, the smoking of a few cigarettes can render healthy men more breathless on exertion, as was shown to be the case in a large proportion of the patients under examination. The results show clearly that the soldier should be warned against inhaling, and, of course, he should avoid excess.

BISMUTH POISONING.

THAT toxic and even fatal results may follow the use of bismuth is not generally appreciated, though the late Professor Kocher in 1903 condemned the use of bismuth subnitrate as a dusting powder for granulating wounds because he had observed ill-effects. Stomatitis, with ulceration and loosening of the teeth and pigmentation of the buccal mucosa, vomiting, diarrhœa with passage of blood and mucus, and nephritis are the principal manifestations. In the *Cleveland Medical Journal* for June Professor John Phillips, of the Western Reserve University, has reported the following case. A lad, aged 18 years, was admitted into hospital on Oct. 7th, 1915. Three months before he was wounded with a pitchfork in the left knee. The joint became red and swollen, so that it had to be opened and drained. A sinus was left which closed after some time. Five weeks before he was seen he began to complain of soreness of the mouth, which grew rapidly worse, so that he could take only fluids. He was much wasted. The breath was offensive and foul mucus constantly dribbled from the mouth. The posterior part of the tongue and hard palate, the uvula, and the gums were covered with a dark-grey necrotic mass which could be easily removed, leaving a bleeding surface. The cervical glands were enlarged. There was firm swelling of the left knee-joint. The urine contained a slight amount of albumin and hyaline and granular casts. At first cancrum oris was diagnosed, as the slough obscured the pigmentation. After about 10 days the slough separated, leaving a bleeding surface, and pigmentation of the mouth, particularly of the gums, was observed. Three days after admission he had three general convulsions. A week later severe diarrhœa, with much mucus and some blood in the stools, began. It was then noticed that there was marked pigmentation of the rectal mucosa. He became so anæmic that on Oct. 23rd the red corpuscles numbered only 1,500,000. The correct diagnosis was not made until Nov. 8th, when the X rays revealed in the knee-joint a large quantity of bismuth (which it was then ascertained had been injected into the sinus). The joint was opened and as much of the bismuth as possible removed. Transfusion of blood was performed, but he died three days later. The necropsy showed acute ulcerative colitis, acute parenchymatous nephritis, and diffuse brown pigmentation of the viscera, especially of the colon. From the use of bismuth subnitrate another kind of poisoning—nitrite poisoning—may result. Professor Phillips reports two cases. A child, aged 4 years, was seen in consultation. On the previous day she had been given for colitis a drachm of bismuth subnitrate in a starch enema. Twelve hours later she became nauseated, very cyanosed with a small weak pulse, and partially comatose. This condition continued throughout the day. The blood was very dark. The colon was irrigated repeatedly. Within 24 hours she was much better, the cyanosis being less marked, and by the third day all the symptoms had disappeared. In the second case a man, aged 50 years, was seen in consultation for stupor and cyanosis. On the previous day he was given an ounce of bismuth subnitrate in milk for X ray examination of his stomach. During the night he was nauseated and had a severe chill. Towards morning he became cyanosed and unconscious. When seen he was deeply cyanosed, the mucous membranes being plum-coloured. The pulse was 140 and very weak. The colon was irrigated several times and much bismuth washed out. Under stimulation and transfusion of blood he recovered. These cases show that bismuth subnitrate should be given with care and not be used for the purpose of X ray examination.

THE NEGLECT OF NATURAL SCIENCE.

LAST year the Government decided to appoint a committee on the subject of scientific education in secondary schools, and it was ultimately formed with Sir J. J. Thomson as chairman. The committee were asked to inquire into the position occupied by natural science in the educational system of Great Britain, especially in secondary schools and universities, and to advise what measures are needed to promote the study of natural science, regard being given to the requirements of a liberal education, to the advancement of pure science, and to the interests of the trades, industries, and professions which particularly depend on applied science. Amongst the important representations which have been brought before them are those from the "Committee on the Neglect of Science," presided over by Sir Ray Lankester. In the opinion of this committee it is a matter of urgency, in order to promote national efficiency in the near future, that the natural sciences should be made an integral part of the educational course in all great schools of this country, and should form part of the entrance examination of the Universities of Oxford and Cambridge as well as of the newer universities. It was also held that it is in the highest degree desirable that the Government should exercise the large power which it possesses of encouraging the study of the natural sciences and thereby increasing the efficiency of our public servants (1) by assigning capital importance to the natural sciences in the competitive examinations for the home and Indian Civil Service; (2) by requiring some knowledge of the natural sciences from all candidates for admission to Sandhurst. The method indicated is held to be the only one by which it is practicable to bring about the desired change in the attitude of the schools throughout the country towards the natural sciences and to make general some knowledge and understanding of these sciences. Clearly, as the results of such changes will only develop in the course of years, it

is desirable, if they are determined upon action, that the matter should be at once taken in hand by the Government. The Government Committee were also strongly urged to remove "the stumbling-block of compulsory Greek at the Universities of Oxford and Cambridge," and it was pointed out that though a majority of the people who have given attention to the matter are now in favour of reform, the way is blocked by the non-resident voters, and this way should, in the opinion of the committee, be cleared by Government interference. It is suggested that more direct encouragement of science is needed, so that there should be an increased number of careers open for highly-trained men, while existing scientific services should be expanded, so that men who had received high scientific training could find careers. It is not proposed that the subjects of languages and history should be displaced, but there can be little doubt that there must soon be secured for the teaching of natural science a position of no less importance, as an essential component of a liberal education, than that which is now held by the teaching of languages and history, and the views of the Government committee on this question may well lead to important modifications in the curriculum at our centres of education.

DEATH CERTIFICATION.

THE serious and increasing shortage of medical men available for civilian practice is making itself felt in various ways. The *Guy's Hospital Gazette* for July states that those responsible for dealing with acute cases sent up to the hospital are finding that the work of the general practitioner is gradually becoming less efficient. Acute abdominal cases, it is here stated, are constantly being admitted in which perforation had evidently been present for some days. In view of the urgent call on the practitioner's time in matters of life and death it is not unnatural that less time and thought are available for work of a more formal character. At a recent inquest at Hackney held by Dr. Wynn Westcott on the body of a labourer the unusual form of a death certificate excited comment. The deceased was seen by a medical man on July 25th at his surgery, and by no other practitioner before his death, which took place on August 4th. Meanwhile the medical man had gone away, and before doing so had signed a certificate which a colleague, who was temporarily attending his patients, filled up and handed to the relatives. This, as the latter gentleman stated in his evidence, he did after making inquiries, but he admitted that he had not seen the patient when alive, nor apparently had he seen the body. The jury accepted the certificate as accurate and returned a verdict of "Death from natural causes," adding that, in their opinion, the proceeding was irregular, the coroner having already made observations to the same effect. While the giving of a death certificate in such a manner is irregular and obviously undesirable, we cannot find evidence that it is illegal. It cannot be said to be in accordance with the spirit of the statute of 1874, which regulates the registration of deaths, but done as in the case under comment without any wrong intention it does not constitute an offence. The Act (37 & 38 Vict. c. 88) only orders that a medical practitioner attending a patient in his last illness shall sign and give to someone who has to give information to the registrar a certificate stating to the best of his knowledge and belief the cause of death. Before the Departmental Committee which inquired into the law relating to coroners Mr. J. Brooke Little, in the course of his evidence, was asked whether a medical man was obliged to see the body after death, when he replied as follows:—

> I think the Registration Acts do not point out in any way how the medical man is to prepare himself for giving his certificate, except that it appears to be assumed that the certificate will be given by the medical practitioner who attended the deceased during his last illness. Section 20 of the Act of 1874 makes it incumbent upon such a practitioner to give a certificate of the cause of death in the prescribed form. There is, however, no statutory direction that he shall see the person after death before he gives his certificate.

The first part of this reply calls attention to the unsatisfactory looseness of the law as to who is to be responsible for the giving of a certificate of the cause of death, although the question asked was directed to another point—that is to say, to the desirability of the medical man inspecting the body as to which the certificate is given.

SYNTHETIC ALCOHOL FOR COMMERCIAL PURPOSES.

THE synthesis of alcohol from its component elements would afford great relief to a country like Switzerland, dependent for its usual supply of alcohol on outside sources and naturally loth to employ for the purpose any of its scanty stock of starch. Dr. Fleissig, apothecary to the Town Hospital in Basle, tells[1] how this problem has been solved, although, unfortunately, its complete technical application will require 18 months to work out. Calcium carbide is now produced in Switzerland to an annual amount of 70,000 tons, and is the starting-point of the synthesis. The acetylene evolved from it combines with a molecule of water to form acetaldehyde in the presence of a catalyst such as mercuric sulphate. Two additional atoms of hydrogen, produced electrolytically, unite with the aldehyde to form alcohol under the influence of certain metals as nickel, platinum, or palladium. A ton of alcohol can thus be obtained from 2 tons of carbide and 500 cubic metres of hydrogen, requiring, apart from electrical energy, only 2½ tons of coal and 4 tons of chalk. Switzerland's average requirement of 10,000 tons of alcohol would therefore demand the import of only some three-quarter million francs worth of coal, while the ready-made alcohol at present costs 4,000,000 francs. The process requires, of course, a large amount of electrical energy—a ton of alcohol demands 11,000 kilowatts to produce—but this is readily supplied by the "white coal" available in the water-power of Europe's central plateau. We know well enough that alcohol may be synthetically produced from acetylene, but up to the present this has only been done on a laboratory scale. In this case the method has been to convert the acetylene into ethylene by contact with hydrogen, and to pass the ethylene so produced into sulphuric acid, sulpho-vinic acid resulting. Finally, this acid when distilled with water gives alcohol. The synthesis on a commercial scale will be watched with close interest by all those who use industrial alcohol.

[1] Correspondenzbl. f. Schw. Aerzte, 1917, p. 948.

DONATIONS AND BEQUESTS.—The late Mr. S. H. Whiting, of Charlton King's, Cheltenham, bequeathed £500 each to the Gloucester Royal Infirmary, Cheltenham General Hospital, and the Stroud Hospital, and £200 to the Cirencester Cottage Hospital.

THE PROBLEM OF TUBERCULOSIS.

By H. HYSLOP THOMSON, M.D.Glasg., D.P.H.Liverp.,
MEDICAL OFFICER OF HEALTH FOR THE COUNTY OF HERTFORDSHIRE.

So much has been written about the problem of tuberculosis that any further contribution which contains nothing new with regard to the measures to be adopted for its eradication may well be considered by many as superfluous. The present, however, appears to be an opportune moment to review what has been done in the past and to endeavour to forecast to what extent present efforts require to be supplemented by further practical measures in order that this disease may be adequately and comprehensively dealt with. There exists no royal road to the solution of the problem of tuberculosis, and the present efforts which are being made throughout the country to stem its ravages have suffered to some extent from the fact that they are based on restricted, if expert, views rather than on a broad comprehensive outlook. The question is not infrequently asked why so much energy and thought are directed towards the solution of the tuberculosis problem to the apparent exclusion of other diseases; the answer is that in tuberculosis we have a fairly accurate index of the health standard of a community and that in the absence of any specific cure we are compelled to promote conditions which are inimical to the presence and spread of the disease, with the results that the health standard of the community is raised and resistance to attacks by other forms of disease is increased.

Nomenclature.

Various terms are frequently applied in relation to tuberculosis the use of which should be discouraged. The term phthisis is gradually being discarded, although it is still too frequently used. Pulmonary tuberculosis and lung tuberculosis are the only terms which can correctly be used to designate the pulmonary type of this disease. The popular terms consumption and consumptive, owing to the loose and inaccurate manner in which they are frequently used, are responsible for much of the misconception regarding pulmonary tuberculosis which at present exists in the public mind. While the term consumption is regarded as connoting a disease of high infectivity, the term pulmonary tuberculosis suggests a morbid condition of much less severity. Originally the term consumption was used to designate open cases of lung tuberculosis with classical signs and symptoms, but popularly it has come to be regarded as applicable to all forms of that disease. The confusion caused in a patient's mind when he is informed that he is consumptive but has not consumption may well be imagined; the former term being sometimes loosely used to designate the so-called pretuberculous stage. It must be admitted, however, that it is extremely difficult to avoid the occasional use of these terms in general practice, although the desirability of educating the public in the correct use of medical terms is obvious. The medical practitioner is frequently asked the question if an individual has consumption and if the condition is one of early quiescent or closed pulmonary tuberculosis. The wisest course to pursue is to answer in the negative, and to state that the condition is one of lung tuberculosis, which if progressive might eventually reach the stage popularly known as consumption. The term pretuberculous has been not infrequently used to indicate a condition of health preceding actual tuberculous infection. As a matter of scientific fact, the majority of so-called pretuberculous cases are cases of early or latent disease, and the term can only be correctly applied to that stage of lowered resistance which precedes actual infection with tubercle bacilli, but as clinically we have no means of recognising or gauging this stage in relation to tuberculosis the term should be discarded, as it is liable to mislead.

Notification.

The present methods of notification require to be remodelled. More detailed information is necessary so as to amplify and systematise measures adopted to prevent the spread of the disease. The notification form should supply the medical officer of health with definite information regarding the type and stage of the disease, the absence or presence of tubercle bacilli in the sputum, and as to the necessity for precautionary measures or any special form of treatment. A copy of such a notification form should immediately be sent to the medical officer of the authority responsible for the institutional treatment of tuberculosis. Detailed information of this kind supplied at the outset by the general practitioner would facilitate the early and appropriate treatment of the disease and would enable health authorities to map out with ease the districts, streets, and houses in which cases of open tuberculosis most frequently occurred. For such information an increased notification fee would have to be paid, and the grading of such fee according to whether the sputum was examined or not would be desirable; but the value of such pioneer knowledge regarding each individual case is too apparent to require any extended argument. Copies of Notification Form C, giving information of patients' discharged from hospitals and sanatoria, should also be sent to the authority responsible for the scheme of treatment in county districts.

Administration.

If the present and future schemes for dealing with tuberculosis are to yield sustained and adequate results two essential conditions with regard to administration must be fulfilled. The first is the unification of all effort under one responsible authority, and the second is the provision of adequate facilities for prevention and treatment. Under present administrative arrangements the efficient and expeditious treatment of tuberculosis is impossible. Two authorities are locally responsible for administration in connexion with this disease, and one of these has quite insufficient funds to meet the demands for treatment. This dual responsibility leads to duplication of effort and waste of time in unnecessary clerical work. The treatment of disease is never advantaged by elaborate reports and the expenditure of time and thought on clerical work, hence the desirability of adopting a simple uniform method of recording cases and of supplying information on application forms for institutional treatment. The sending of patients to various institutions in different parts of the county leads to administrative difficulties, but these cannot be overcome until each authority, or combination of authorities, provides its own facilities for treatment. While existing schemes for dealing with tuberculosis take a fairly comprehensive view of the clinical requirements of the patient they do not include efficient and far-reaching measures for conserving the results of treatment and for preventing ths development and spread of the disease. The care and after-care of tuberculous patients have been left almost entirely to voluntary effort, whereas they should be included as an important supplementary part of official schemes. The questions of housing and occupation in relation to the prevention of the disease and the influence they exercise on the health and economic value of the individual with arrested tuberculosis must also be seriously faced.

Preventive Measures.

The causes of tuberculosis are too well known to require description. Various conditions tend to impair the resistance of the human body to tuberculosis, and these are intimately associated, and for the most part interdependent. Unhealthy home conditions more than any other factor pave the way for tuberculosis, and they arise from three causes—viz., insanitary surroundings, insanitary houses, and the insanitary habits of occupants. When all three occur the incidence of tuberculosis is high and the health index is low. The abolition of insanitary areas and the provision of adequate and efficient housing accommodation must constitute a part of the campaign against tuberculosis and a serious effort to solve the housing problem when the war is over may be anticipated. Time and effort would be saved by the standardising of certain types of houses for rural districts. Existing houses when they become empty should reach a certain hygienic standard before they are reoccupied. The combined kitchen and sitting-room with a large window surface with efficient cross ventilation and facilities for washing and cleanliness are essential features of a healthy working-class house. The insanitary conditions arising from neglect and ignorance are not so easily combated; in any effort to improve such conditions the services of the medical practitioner might be more extensively utilised. During his professional visits the private medical attendant is in a position to note the evidence of dirt and neglect, the closed window, the diminished cubic space due to overfurnishing, overcrowding, the multitudinous array of knick-knacks which harbour dust, and the food exposed to contamination by dust and flies. By tact and timely suggestion he would be able to secure some improvement;

but should conditions remain so unsatisfactory as obviously to impair or endanger health he should be in a position to fall back on energetic action by the health authorities. While the modern trend of social improvement is towards the State becoming responsible for much to the individual, the latter must realise that he will be called upon to be responsible for much to the State. Certain channels of infection require to be dealt with by legislative measures if the spread of tuberculosis is finally to be checked and controlled. Legislation to provide a milk-supply free from contamination by tubercle bacilli and other organisms is long overdue, while the provision of central public abbatoirs is an obvious public health measure, in view of the dangers arising from tuberculous meat. The segregation of certain types of laryngeal and pulmonary tuberculosis is also an essential prophylactic measure.

Institutional Treatment.

The institutional treatment of tuberculosis includes dispensary treatment, sanatorium treatment, the hospital treatment of pulmonary tuberculosis, and the hospital treatment of non-pulmonary tuberculosis. The dispensary provides a centre for the diagnosis and treatment of early cases and for the observation of suspects and doubtful cases. The importance of the dispensary as a unit for the observation and treatment of doubtful cases is obvious when it is realised that by this means a longer term of sanatorium treatment is secured for definite cases of the disease. The insistence of the sanatorium physician for early cases is well known, but the whole scheme suffers if early cases are confounded with doubtful cases. The work in connexion with the dispensary system is for the most part carried out by whole-time officers, and this is, no doubt, the best method of carrying out this part of the scheme, although a closer coöperation between the dispensary officer and the general practitioner is desirable. It has been suggested that the work in connexion with the dispensary should be uniformly carried out by a rota of general practitioners, with the tuberculosis officer acting in a consultative capacity. This would no doubt have certain advantages and would be practicable under altered conditions, but it is difficult to conceive the clerical work inseparable from record-taking recommending itself to the busy practitioner. The hospital treatment of acute and advanced cases of pulmonary tuberculosis constitutes the most important part of the scheme both from the treatment and preventive standpoint. Experience has shown that in the absence of such accommodation a gap exists between the dispensary and the sanatorium which makes efficient and expeditious dealing with tuberculous cases impossible. Hospital treatment means skilled medical attention, efficient nursing, and up-to-date hospital administration, and while it makes provision for the segregation of advanced cases it also provides facilities for the treatment of acute cases of recent onset by induced pneumothorax, antiseptic and other measures, as a result of which a certain proportion are saved. At the present time there exist no compulsory powers for the removal of advanced cases, although such are desirable in certain types of the disease under certain conditions. In the absence of such powers it is necessary to make the hospital inviting to the patient by instituting a reputation for efficiency of treatment and administration. The Hertfordshire County Council has recently opened a hospital with the provision of 30 beds for acute and advanced cases, and the experience of the last few months in that institution has proved that the acme of the infectivity of pulmonary tuberculosis is reached during the last few weeks of life, and that the knowledge of being transferred to the sanatorium when a certain stage of improvement is reached provides a strong incentive to the patient to remain and persevere with treatment.

The sanatorium treatment of tuberculosis has been carried out in this country for over 20 years, and while its benefits are undoubted, its limitations, as the treatment is at present carried out, are definite. That the present sanatorium methods do not yield the results expected must be admitted and the explanation is threefold. Firstly, in the absence of adequate hospital accommodation unsuitable cases are sent to the sanatorium; secondly, the popular view that three months' treatment in a sanatorium will suffice to secure permanent arrest of the disease must be discarded; and, thirdly, the after-care of patients, with the provision of suitable employment, &c., must constitute an official part of the scheme. If sanatorium treatment is to yield the best results the question of the patient's capacity for work and of his future employment must be intimately linked with the treatment throughout its whole course. The sanatorium should be reserved for early and non-reactive cases, and simultaneously with improvement in health the patient should be instructed and employed in outdoor occupation, experience in which will subsequently prove of value to him. To secure the best results, therefore, the sanatorium should be remodelled on the basis of an industrial institution, while the duration of residence should be considerably increased. In the industrial sanatorium the buildings would be of simple construction, and chief attention would be centred on the land and on facilities for useful employment. No tuberculous patient should be discharged from a sanatorium so long as there exists any possibility of further improvement and while there is no prospect of immediate return to suitable work. Work means wages and food, and good food with healthy home conditions is essential to maintain the condition of arrest and economic cure which is obtained by prolonged residence in a sanatorium. The Hertfordshire County Council has purchased a site which is well suited for an industrial sanatorium of this kind, and it is anticipated that on the conclusion of the war the building will be proceeded with. The value of tuberculin in the treatment of pulmonary tuberculosis has been much debated, but, as was pointed out some years ago by the writer, tuberculin gives the best results when employed in the sanatorium at the stage when the beneficial auto-inoculation induced by graduated manual labour is on the wane.

The hospital treatment of non-pulmonary tuberculosis is carried out either in special open-air hospitals or in general hospitals. At the present time the provision of such accommodation for insured persons is quite inadequate. The treatment of non-pulmonary tuberculosis on rational lines well repays the time and cost involved. Experience has shown that such cases can be efficiently dealt with in general hospitals in small urban districts. The good results obtained by exposing indolent tuberculous lesions to fresh air and sunshine are becoming more fully recognised.

Domiciliary Treatment.

The question of the domiciliary treatment of tuberculosis is one which calls for some consideration. It must be admitted that domiciliary treatment has not proved as successful as was anticipated. No doubt, owing to the war, it has not had a fair or extended trial, but under the present system it is doubtful if it will prove satisfactory even in normal circumstances. If the domiciliary treatment of tuberculosis is to meet with any measure of success two things must occur at the outset—namely, the existence of fairly healthy home conditions and the recognition of the necessity of rest under open-air conditions when the temperature is raised. In the absence of this essential rest when the temperature is above the normal the individual with pulmonary tuberculosis will sooner or later walk himself into his grave. The present system of domiciliary treatment requires to be remodelled. A uniform method of carrying out the treatment according to well-defined rules is desirable. The method of record-keeping in connexion with domiciliary treatment should be of the simplest character and should consist of a special card similar in some respects to that used in connexion with medical benefit. The present method of payment for the services of the general practitioner in connexion with the treatment of tuberculosis is not quite satisfactory and might with advantage be altered. Some uniform procedure with regard to the prescribing of drugs and appliances is also desirable. A special formulary for use in domiciliary treatment would be a distinct advantage. It would also serve a useful purpose from a prophylactic standpoint if all chemists kept in stock a standardised sputum flask which could readily be obtained by prescription. A closer coöperation between the tuberculosis officer and the family practitioner is desirable. This demands tact and knowledge on the part of the former and willingness to coöperate on the part of the latter. In not a few cases in my own experience the value of such close coöperation to the patient has been proved. Under present conditions, however, the time of the tuberculosis officer is too much occupied in dispensary work to permit of such coöperation, although the importance of a high standard of domiciliary treatment cannot be too strongly emphasised. In domiciliary treatment prevention and treatment must act in unison, as it is in the homes of

the people that there exists the greatest need for the carrying out of adequate prophylactic measures.

Care Treatment.

The care treatment of tuberculous patients constitutes an important and essential adjunct to medical treatment. The Public Health (Prevention and Treatment of Diseases) Act, 1913, enables public health authorities, with the sanction of the Local Government Board, to carry out measures for the care and control of tuberculous patients. The aim of such measures is to increase and conserve the good results obtained by medical treatment, and at present they are carried out through the agency of voluntary care committees. The experience of the past few years has emphasised the desirability of coördinating such efforts in one comprehensive and official scheme, so that there may be sufficient financial help to secure effective, sustained, and uniform action. The extent to which the working capacity of the individual with arrested tuberculosis is made use of as a national asset depends in large measure on the assistance he obtains in securing suitable employment. The economic question in relation to tuberculosis is of such far-reaching importance that it cannot be overlooked in any comprehensive scheme for dealing with this disease. The outdoor relief granted by boards of guardians to chronic and advanced cases of tuberculosis has frequently proved of value, and it would in great measure solve the problem of care treatment if this department of the Poor-law system so far as it relates to actual disease were reorganised and were transferred to public health authorities as an official system of care and help in connexion with tuberculosis and other diseases.

Tuberculosis and the War.

One of the many effects of the war has been to broaden our outlook in connexion with tuberculosis and other health problems. The influence exercised by military service on the disease itself is now more accurately estimated. While the conditions inseparable from active service abroad is liable to diminish the resistance to tuberculous infection the life associated with military training in this country undoubtedly exercises a beneficial effect on the health of the soldiers. The military authorities for some time have been exercising considerable care with regard to the admission of possible cases of tuberculosis to the Army. Men with healed or localised latent pulmonary tuberculosis, nowever, are not unfit for certain forms of military or other national service; indeed, under favourable conditions, they benefit by it. Given fresh air, good food, and regularised physical exercise, such cases undergo marked improvement in general health and physical vigour. The contra-indications, however, are definite, and are as follows: (*a*) the presence of tubercle bacilli in the sputum, (*b*) a temperature range above the normal, (*c*) the presence of crepitations or other gross physical signs, and (*d*) a history of tendency to hæmoptysis. In the majority of cases discharged from the Army suffering from tuberculosis, in the writer's experience, the men have been on active service and the disease has been acute and progressive in type. This fact accentuates the urgent need for adequate hospital accommodation, for not only is it a national duty to provide the type of treatment best suited to the requirements of each discharged soldier, but it is highly desirable, from the viewpoint of public health, that cases in which the disease is acute or advanced should be transferred immediately to a suitable hospital for treatment.

Conclusions.

The death-rate and attack-rate from tuberculosis and the infant mortality constitute a fairly reliable combined index of the health standard of a community. If these rates are low the death-rate from almost all other diseases is also low, important possible exceptions being malignant disease and organic heart disease. The expenditure incurred in connexion with the treatment of tuberculosis will fail to secure an adequate return unless searching prophylactic measures are simultaneously carried out, and unless such treatment is supplemented by an official scheme to conserve the beneficial economic results obtained. The measures which are recognised as essential for the prevention of tuberculosis are also instrumental in raising the general standard of health and in protecting the individual from other forms of disease; this fact alone emphasises the importance of a broad and comprehensive outlook in dealing with the problem of tuberculosis.

THE CONTROL OF VENEREAL DISEASES.

The American Association for the Control of Syphilis.

WE have received from Dr. M. F. Engman, of St. Louis, Mo., a statement of the objects of the American Association for the Control of Syphilis, which was organised at Cincinnati on May 23rd and 24th last. These objects are the promulgation of knowledge of syphilis among medical men, medical institutions, boards of health, hospital boards, dispensary attendants and boards, and other organisations having the care and treatment of syphilis. It is hoped to develop the investigation of the disease from the social and economic sides. Plans are being made to collect standardised statistics from the various institutions now treating syphilis; to further the establishment of free clinics and dispensaries for the diagnosis and treatment of syphilis; and to encourage the more comprehensive teaching of syphilis in medical schools. The association proposes to operate through a national body and local branches in various cities, acting in close coöperation with the American Social Hygiene Association. The membership of the association at present is composed of the following:—

Dr. W. T. Belfield (Chicago), Dr. Ernest D. Chipman (San Francisco), Dr. W. T. Corlett (Cleveland), Dr. Isadore Dyer (New Orleans), Dr. M. F. Engman (St. Louis), Dr. J. A. Fordyce (New York), Dr. Marcus Haase (Memphis), Dr. H. H. Hazen (Washington), Dr. M. B. Hartzell (Philadelphia), Dr. H. B. Kleinschmidt (St. Louis), Dr. G. M. MacKee (New York), Dr. E. L. McEwen (Chicago), Dr. W. H. Mook (St. Louis), Dr. H. Morrow (San Francisco), Dr. H. J. Nichols (San Francisco), Dr. Oliver Ormsby (Chicago), Dr. Sigmond Pollitzer (New York), Dr. W. A. Pusey (Chicago), Dr. A. Ravogli (Cincinnati), Maj. Matthew Reasoner (Washington), Dr. J. F. Schamberg (Philadelphia), Dr. Morton Smith (Boston), Dr. W. F. Snow (New York), Dr. H. W. Stelwagon (Philadelphia), Dr. G. H. Walker (Baltimore), Dr. Grover Wende (Buffalo), Dr. Udo Wile (Buffalo), Dr. J. M. Winfield (Brooklyn), and Dr. H. R. Varney (Detroit).

The following are the executive officers of the Association: Dr. M. F. Engman, president; Dr. J. F. Schamberg, vice-president; Dr. H. E. Kleinschmidt, secretary and treasurer, 607, Federal Reserve Building, St. Louis, Mo.

Unqualified Prescribing and Advertisement.

At the meeting of the London County Council last week the Public Health Committee reported as follows:—

An Order, dated July 18th, has been made by the Local Government Board under section 1 (2) of the Venereal Disease Act, 1917, applying to the areas of certain counties (including London) and county boroughs section 1 (1) of the Act prohibiting any person in such areas other than a qualified medical practitioner for reward either direct or indirect from treating any person for venereal disease or prescribing any remedy therefor, or giving any advice in connexion with the treatment thereof, whether the advice is given to the person to be treated or any other person. The Act also prohibits the issue of advertisements relating to the treatment of venereal disease and, as from Nov. 1st, 1917, the issue of advertisements relating to the sale of preparations to be used as medicines or medicaments for the prevention, cure and relief of any venereal disease. The prohibition with regard to advertisements does not, however, apply to announcements by local or public authorities published with the sanction of the Local Government Board or to publications sent only to duly qualified medical practitioners or wholesale or retail chemists for the purposes of their business.

Treatment of Venereal Disease at Portsmouth.

A report on the work of the department established under the Venereal Disease Act, 1917, was submitted to the Committee of the Royal Portsmouth Hospital at their meeting on July 20th, by Captain A. Cambell, R.A.M.C. (T.), medical officer in charge. A detached building in the grounds of the hospital has been utilised for the purpose. The staff consists of two medical officers, one sister, and two orderlies. The department has been open for five months and during that time there were 152 males, 120 women, and, 26 children, with a daily average attendance of 60 to 70 patients. Civilians only were treated; women patients failed more than men to realise the necessity of attending regularly. Few women living vicious lives sought treatment, but many young girls attended. The attendance of cases of congenital syphilis was most satisfactory, mothers being anxious to bring their children. The results clearly showed that the clinic was doing excellent work.

Facilities in Devon and Cornwall.

The committee of the Royal Devon and Exeter Hospital has decided, with the sanction of the Local Government Board, to provide an out-patient department for venereal diseases and a certain number of beds for in-patient treatment.

At the last meeting of the Cornwall County Council it was decided to establish at once a clinic for venereal disease in the county at an estimated cost of £400.

Public Measures of Control in Germany.

The Reichstag has accepted the recommendations of its Committee on Population in regard to measures for combating venereal diseases. These include: (1) To make it a penal offence for a person who knows, or has good reason for knowing, that he has venereal disease to indulge in sexual intercourse; (2) to schedule venereal diseases in the Public Health Acts; (3) to set up treatment centres in each commune; (4) to engage the help of clubs and friendly societies; (5) to obtain accurate statistics of prevalence; (6) to make an examination in venereal diseases part of the final test for the medical diploma. Other more radical measures were postponed for the present.

The Remuneration of Medical Officers of Treatment Centres.

The resolutions of the Council of the British Medical Association in regard to the remuneration of medical officers attached to venereal treatment centres were recorded in THE LANCET of Nov. 11th last. At the recent Representative Meeting, where these recommendations came up for discussion, it was decided to make no distinction in regard to remuneration between London and the provinces and to leave the fixing of the scale to the local option of the divisions. The recommendation, as accepted by the Representative Meetings, runs as follows:—

That the following scale of remuneration for part-time senior medical officers of clinics be approved and recommended to divisions as a guide in their negotiations with local authorities:—

	Per session.
For one or two sessions per week, not exceeding 2½ hours each	£3 3 0
For three or more sessions per week, not exceeding 2½ hours each	2 12 6

The proper minimum salary for a whole-time resident clinical assistant was also fixed at £250.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Antityphoid Revaccination.

THE Under Secretary of State for the Service de Santé has issued to the sanitary services an order to proceed with the antityphoid revaccination of all those who have not been revaccinated within two years. Several cases of typhoid fever have appeared in the war zone as well as at the depôts, even among those already vaccinated according to the regulations in force. Bacteriologists estimate the duration of immunity resulting from the use of the various vaccines as not longer than two years. The vaccines employed at the beginning of the war comprised three successive inoculations at intervals of six or eight days, but the men often received only one or two injections as a result of lack of time or the occurrence of acute indisposition following the first puncture. The new order prescribes revaccination, employing a single injection of the same vaccine as was used in the first instance. At present four brands of vaccine are in use in the French Army and Navy, most frequently that of M. Vincent sterilised with ether, those of M. Widal and M. Chantemesse sterilised by heat—the most recent—and that of M. le Moignie, where the culture is suspended in an oily medium, a specially useful vaccine for troops, inasmuch as immunity is assured after a single injection.

Transmission of Anthrax by the Sheepskins worn by Soldiers.

Many soldiers during cold weather wear a sheepskin coat over their uniforms to protect against damp and chills. At Marseilles Dr. Roger recently noted among the troops several cases of malignant pustule undoubtedly due to a virus transmitted by the sheepskin. The pustules appeared on the thorax, neck, and cheek. In the last case the soldier was inoculated while sleeping with his head supported on his arm. One death occurred. Dr. Roger recommends the systematic disinfection of this kind of clothing before it is handed out to the men.

The Relation of Blood Pressure to the Age and Resistance of the Soldiers at the Front.

M. de la Prade has examined at the front a number of infantry, territorial, and artillery men, selected from those who have been between 20 to 30 months at the front and have thus suffered all the fatigues of war. He classifies his 87 observations according to age-groups: 20–30 years, 30–40 years, 40–43 years, and, finally, over 43 years; with averages of strain for each group. He finds that at 40 years and over the blood pressure reaches the limit of the normal, indicating the point at which circulatory equilibrium ceases to be sufficiently elastic to support a sudden considerable strain. Above 43 years pressures become pathological. M. de la Prade's conclusions are reassuring. Trench warfare appears to have been borne well by the great majority of the troops at the front. Men of 40 years should be considered to a certain extent. From 43 years and on it is advisable not to place much reliance on the men. Their physical resistance is no longer equal to the continuous fatigue of warfare, at any rate in the front line.

Penetrating Wounds of the Abdomen.

M. Barnsby recently reported to the Society of Surgery the result of the treatment of 61 abdominal wounds observed during seven months at an advanced surgical post. Of the 43 submitted to operation only 28 were found to have wounds penetrating the viscera and were retained at the post. Among these 28 treated by immediate laparotomy there were 15 recoveries and 13 deaths. The patient with an abdominal wound generally arrives in a state of shock; he is placed at once in a very warm room, where pulse and respiration are counted and arterial pressure determined. At the same time morphine, camphor, and intravenous injections of camphor and adrenalin are administered. The stay in this room is made as short as possible. M. Barnsby shows his preference for chloroform as an anæsthetic, finding that when ether is used chills often result, leading too often to pulmonary complications. No hesitation, he says, should be felt in making an extensive opening at the outset. Warm saline should be used to irrigate in order to avoid chill to the viscera and fall of blood pressure. Perforations of the small intestine, he holds, should be sutured in two planes after refreshing the edges of the wound. Drainage should be for as short a time as possible, and the abdominal wall united in one plane with metal stitches. The patient may be moved from the first or second day, but should be under observation and kept still from the fifth to the seventh day.

Treatment of Discharged Soldiers in Hospital Annexes.

At the beginning of 1916 the municipality of Paris, on the proposition of MM. Dausset and Henri Rousselle, voted a sum 5½ million francs for the isolation and treatment of discharged soldiers suffering from tuberculosis or affections of the respiratory passages. In spite of the difficulties occasioned by lack of material and labour 700 beds are now available in ten temporary buildings erected as annexes to the following hospitals: Laënnec, Saint-Antoine, Cochin, Lariboisière, Tenon, Broussais, Salpêtrière, La Rochefoucauld, and Debrousse. By the end of this year 1400 other beds will be available for patients at the institutions of Brévannes, Lagache, Ivry, and Bicêtre.

August 11th.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Gen. D. T. Hoskyn is placed on the Retired List.

Staff-Surgeons to be Fleet-Surgeons: **T. B. Shaw, A. T. Gaillefton, G. S. Davidge, P. T. Nicholls.**

The following appointments have been notified:—Surgeon General P. B. Handyside to Chatham Hospital. Fleet-Surgeons: K. A. Jones to *Pembroke*, J. Whelan to *Royal Arthur*, and R. L. Jones to *Victory*. Temporary Surgeons: K. B. A. Aikman to Chatham Hospital, D. Southerland and J. A. Hadfield to *Victory*, and W. Everett to Plymouth Hospital.

ARMY MEDICAL SERVICE.

Temp.-Col. M. MacLaren, C.M.G., Canadian A.M.C., to be Deputy Director of Medical Services.

Temp. Lieut.-Col. C. E. Doherty, Canadian A.M.C., to be Assistant Director of Medical Services.

Temp. Major J. S. Jenkins, D.S.O., Canadian A.M.C., and Temp. Capt. H. B. Logie, Canadian A.M.C., to be Deputy Assistant Directors of Medical Services.

ROYAL ARMY MEDICAL CORPS.

Hon. Lieut.-Col. A. S. Woodwark to be temporary Lieutenant-Colonel.

Temp. Hon. Lieut.-Col. Sir John Collie to be temporary Honorary Colonel.

Sir Alexander MacCormick to be temporary Colonel.

J. F. O'Carroll to be temporary Honorary Lieutenant-Colonel.

Hon. Major S. W. Woollett to be temporary Major.

Lieut.-Col. W. T. F. Davies, D.S.O., late Imperial Light Horse, and Temp. Capt. H. D. Gillies to be temporary Majors.

The undermentioned officers, T.F., to be granted temporary rank:—As Lieutenant-Colonels: Lieut.-Cols. J. Godding, London Regiment; J. W. H. Brown, Royal Engineers. As Majors: Majors H. T. Jenkins, Royal Welsh Fusiliers; S. G. Ogilvy, Royal Scots; J. Gott, Hampshire Regiment; T. W. Mead, Royal Engineers; J. A. Wait, Royal Garrison Artillery; W. E. M. Corbett, Devon Regiment; W. Murray, Royal Field Artillery. As Captains: Capts. C. W. Milner, Notts and Derby Regiment; F. R. Lucas, Royal Scots. As Lieutenant: Lieut. R. G. Oram, London Regiment.

Major W. L. Bennett is placed on Half-pay List.

Temp. Capt. R. H. Bremridge to be temporary Major.

Temp. Capt. R. J. McEwen, Canadian A.M.C., to be acting Major while specially employed.

Temp. Capt. E. M. Lithgow, Royal Highlanders, to be temporary Captain.

Temporary Lieutenants to be temporary Captains: D. N. Knox, E. G. D. Milsom, E. G. H. Weir, B. Rommel, R. Maclean, E. W. H. Cruickshank, R. Massie, W. P. Wippell, J. J. Anning, D. McC. Aitken, J. E. Sandilands.

To be temporary Captains: J. J. Boyd, T. R. St. Johnston, W. P. H. Munden, C. A. Moseley, G. E. Manning, R. F. Gill, J. M. Renton, R. Milne, J. S. Joly, O. R. M. Kelly (temporary Captain from the General List), J. W. McIntosh (Canadian A.M.C.), E. Fidlar (Canadian A.M.C.),

R. F. Yencken and A. E. Lyster, late temporary Captains, to be Honorary Captains.

R. S. Moon to be Lieutenant.

To be temporary Lieutenants: H. L. Clift, J. R. Watson, W. J. Stephens, H. A. Des Brisay (Canadian A.M.C.), A. T. MacKenzie, S. Bree, S. G. Corner, D. A. Dewar, W. J. D. Bromley, T. Winning, A. Davies, R. Davidson, R. R. Wade, J. W. Simon, K. R. C. Hallowes, W. L. English, C. U. Whitney, T. B. Mitchell, E. Banks, P. T. J. O'Farrell, C. A. Joll, A. S. M. Palmer, E. E. Cassady, L. D. Stamp, H. P. Dawson, A. M. Laurie, J. Donaldson, E. U. Williams, H. M. Reeve, M. F. Emrys-Jones, S. M. Vassalli, W. G. Riley, J. F. Hornsey, A. Morton, A. Barker, D. Purdie, R. L. E. Downer, B. Barnett, J. F. Findlay, H. J. Beddow, N. Leonard, R. L. Haines, L. G. Teece, E. F. Thomas, A. D. Crofts, H. J. Rae, G. C. B. Miéville, C. W. Hutt, J. S. Mitchell, R. S. Roper, P. W. Stewart, F. F. Laidlaw, H. C. Martin, A. V. Ledger, J. Fletcher, N. C. Rogers, H. Snape, K. S. Melvin, J. R. Cameron, G. W. B. Shaw, H. H. Molloy, T. Miller, A. Robertson, N. Bradley, P. E. Carroll, H. J. Hoile, M. T. D. McMurrich, A. Boyle, E. E. Atkin, L. T. Kewer, F. Coates, F. D. Parbury, S. L. O. Young, N. McC. Hutchison, F. D. Nicholson.

G. Hodge to be temporary Honorary Lieutenant.

Officers relinquishing their commissions: Temp. Capts. H. G. Gillissie (Canadian A.M.C.), N. E. MacDougall, M. C. Burke, F. J. Brodie, G. M. Gregoire, S. J. C. Fraser, and H. J. M. Adams (on account of ill-health); Temp. Lieut. A. H. McCandlish, G. C. March, and D. North (on account of ill-health), and E. Fidlar.

Temp. Hon. Capt. C. F. R. McDowall, having ceased to be employed with the Moss Side Military Hospital, relinquishes his commission.

SPECIAL RESERVE OF OFFICERS.

To be Lieutenants: A. B. Platt, E. N. P. Martland, W. T. G. Boul and N. Kletz (from Manchester University Contingent O.T.C.), W. Eidinow, A. G. F. McArthur, R. D. Aylward (from the University of London Contingent O.T.C.), S. H. de G. Pritchard, F. W. A. Watt, W. M. Jones (from Manchester University Contingent O.T.C.), H. M. Holt (from Leeds University Contingent O.T.C.).

TERRITORIAL FORCE.

To be acting Lieutenant-Colonels whilst commanding a Field Ambulance: Major F. W. Johnson and Capt. L. A. Dingley.

Major (acting Lieut.-Col.) G. Ashton relinquishes the acting rank on ceasing to command a Field Ambulance.

Capt. H. F. Humphreys is seconded whilst holding an appointment as Deputy Assistant Director of Medical Services.

Capt. B. H. C. Lea-Wilson remains seconded for duty with the Egyptian Army.

Captain W. Seymour is restored to the establishment.

Capts. (temp. Majors) A. Young and L. G. J. Mackey relinquish their temporary rank on alteration in posting and are restored to the establishment.

Capt. J. P. Fagan relinquishes his commission on account of ill-health.

Lieut. D. H. Burleigh, from Special List, to be Lieutenant.

VOLUNTEER FORCE.

W. E. Bond, 2nd Battalion Derbyshire Volunteer Regiment, and W. R. Paton, 3rd Battalion, to be Lieutenants and Medical Officers.

DEATHS IN THE SERVICES.

Lieutenant-Colonel Alfred F. S. Clarke, late R.A.M.C., died at his residence at Bexhill-on-Sea on August 11th, aged 78. He joined the Army in 1861 as staff assistant surgeon, and was appointed later assistant surgeon to the Black Watch in India. He was afterwards assistant surgeon, subsequently reaching the rank of surgeon-major, in the Royal Artillery, and was at one time attached to the famous A Battery A Brigade of the Royal Horse Artillery, "The Chestnut Troop." Later he became surgeon to the Royal Military and Staff Colleges, Sandhurst, where he served for 22 years. In 1886 he received the thanks and praise of the Duke of Cambridge, then Commander-in-Chief, for his prompt and energetic action in preventing the spread of an epidemic of diphtheria in the Sandhurst Colleges.

THE LATE MR. JAMES MCCULLOUGH, L.R.C.P. & S. EDIN.—The death is announced of Mr. James McCullough, which took place on August 2nd in the Royal Victoria Hospital, Belfast, where he underwent an operation on July 11th. He succumbed owing to heart failure. A native of Saintfield, Mr. McCullough practised for years in Belfast, where for a time he was a member of the board of guardians. One of his sons is a member of the medical profession and one of his daughters is a nurse.

Correspondence.

"Audi alteram partem."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH:

THE RENAISSANCE OF MEDICINE.

To the Editor of THE LANCET.

SIR,—The intervention of Sir Clifford Allbutt[1] in this discussion emphasises the difference between the old and new schools. Hitherto the description and investigation of disease have been left mainly in the hands of hospital and consulting physicians and laboratory workers, who have dominated the profession and have believed that their methods and opportunities were such as enabled them to survey the whole field of medicine. They have not realised that on entering on their work they put on blinkers which restricted their outlook, so that their field of experience has been extremely limited, and that there were whole fields essential to the progress of medicine outside their ken. For instance, there is one great field that needed investigation which the events of to-day have forced us to consider—the amount of work a man in impaired health is capable of undertaking. This is a matter which every general practitioner has to consider, and no precise information is to be found anywhere. When the enlightened management of the London Hospital asked me to organise a cardiac department I seized the opportunity to start a clinic with the specific purpose of finding out how much work an individual with a damaged heart could undertake, and the best means for keeping him or her at work. My reason for doing this was that when in general practice I had forced on me the importance of the subject, and although for many years I had studied the subject, I found it too big a problem for me to solve.

To-day the importance of a knowledge of what amount of effort an individual in impaired health can undertake is realised. The State in its hour of necessity has called upon the medical profession to undertake the recruiting of impaired individuals for military work. The military medical authorities took up this work utterly unconscious of the fact that they did not possess the necessary knowledge. Suppose a man whose life had been spent in navigating boats in a canal was suddenly asked to take charge of a sea-going ship. Suppose such a man was ignorant of the laws of navigation, and, worse still, did not know that he was ignorant—it requires no prophet to tell that his ship would likely meet with disaster. Is there then any need to be surprised that the attempts made by the military authorities met with disaster? Had even the College of Physicians taken charge of the recruiting, the same disastrous result would have followed, because the knowledge necessary for the undertaking does not exist.

This failure has come about because the teachers of medicine have never properly studied the question, and the reason probably is that they never realised there was such a problem, but foolishly thought that their limited experience had given them the necessary knowledge. Many, like Sir Clifford Allbutt, do not realise that a life spent in a narrow sphere has dimmed their vision, so that they can neither appreciate the necessity for other methods nor understand their results. I say, with all respect to such an erudite man and eminent clinician, that he has totally failed to grasp the significance of the movement which is gradually beginning to affect the whole field of clinical medicine. This is shown in his letter, for it is evident that he has failed to grasp the significance of the principles which should guide the clinical investigator—viz., to search for the mechanism by which a symptom is produced and to find out the effect which the cause of the symptom has on the patient's future. Doubtless he fancies such principles trite and commonplace and to have been employed continually by him and his fellows. Yet if the matter be looked into it will be found that the old school never really understood their significance nor their application.

I could turn to numerous instances in the writings of Sir Clifford Allbutt to demonstrate this, but let the following

[1] THE LANCET, August 4th, 1917, p. 172.

instance suffice. In Allbutt and Rolleston's "System of Medicine," vol. vi., p. 502, discussing irregular action of the heart, he makes the following statement: "I once found this kind of intermittence in two brothers who came together to me for life insurance; both of them were very angry with me for refusing them, or rather for stating the facts that led to their refusal." It is manifest from this statement and from the context that he had no idea of the nature of the intermission of the pulse in these cases. During the years he had been a hospital physician and a consultant he must have come across hundreds of these cases, and yet it never occurred to him that it was necessary to find out how this abnormal sign arose so as to distinguish this particular sign from others that resembled it. That is to say, he neglected to take the first step in prognosis—differentiation. In rejecting the candidate he gives no reason for doing so, and it is manifest that he could have no accurate knowledge to guide him, so that he falls back on guess-work, oblivious of the harm he may do the individual whose medical examination was committed to his care, and oblivious of the harm done to those who read his book and would be guided by his authority.

When I say he does not realise the importance of these principles I have enumerated I do so because in his reference to my polygraph work he shows that he has not realised that this is but an infinitesimal part of my work, and that all graphic methods merely help to find out the mechanism by which some sign is produced. He has failed to understand not only the methods of my work but the need for these methods. Clinical medicine is a large field, and some employ one method and others employ other methods. Sir Clifford Allbutt has studied heart affairs from his point of view, and I have studied them from mine. When he tells us as a result of his methods that "kinetic energy lost at each beat equals 3600 *n*. per hour," or that "eddies change linear into turbulent stream motion," I frankly confess I don't understand him and refrain from criticising. When I on my part give the results of my observations he plainly does not understand, but he is not deterred from criticising. When, for instance, he criticises my statement that the first sign of heart failure is the sensation produced by a limitation of the heart's power to respond to effort it is at once apparent he does not understand what I have said.

When a patient consults a doctor and the doctor detects an abnormal sign in the heart the question that should guide the doctor to a clear issue is, Does this sign indicate heart failure or does its presence foreshadow its oncoming? This implies a knowledge of what is heart failure. I have read the works of ancient and modern writers to find out what was their conception of heart failure, and though I searched the writings of English, French, and German authors I failed completely to get from any one of them a clear conception of what they meant by heart failure. Recognising that this might be due to my stupidity, I asked an able colonial doctor who came to work in my department to look into the matter. He wished to follow out a line of investigation, and I suggested to him to study heart failure, but first of all to read up the authorities. After three months' careful study he stated that he could not find in a single book an intelligent description of heart failure. I have looked through Sir Clifford Allbutt's writings and can find no help in this matter. When I began my work in following patients up to see what happened to them I really was on the look-out for heart failure. I therefore was able in many cases to detect the early signs of heart failure. Without exception the very first sign was a sensation indicating a limitation of the field of cardiac response to effort. This involved a prolonged inquiry into the nature of the sensations and their differentiation—a field of inquiry of the utmost difficulty. It may seem to the superficial observer that to find out whether a man's powers are limited or not is an easy matter, but I found it a very difficult matter, and the first thing I realised was that I was not sufficiently educated to understand the meaning of the symptoms. These sensations of exhaustion were so varied, provoked in so many different ways, were simulated by so many other conditions that it took me many years before I saw daylight. Sir Clifford Allbutt's remarks upon "effort-tests" are quite beside the mark and show that he has failed completely to comprehend the line of investigation as he has failed to comprehend the significance of the results. I have elsewhere explained my view of heart failure, the result of such a patient inquiry that neither Sir Clifford Allbutt nor any of the old school has ever undertaken. I do not for one moment say that this view is correct; I merely put it forth as representing a provisional conclusion reached at this stage of investigation.

When following out the second of the principles of investigation—finding out what happened to people who showed an abnormal sign—I had necessarily to watch great numbers of people through many years. In doing this I observed frequently the onset of heart failure and watched its progress, carefully noting all the signs and symptoms I could detect. In doing this my attention was directed to many phenomena which had either been overlooked or neglected. It was in the course of this inquiry that I realised the importance of a patient's sensations. Now there is a widespread belief that it is the simplest thing in the world to find out a patient's sensations and estimate their value. Indeed, it is supposed to be so simple that learned authors in treatises on diagnosis barely mention the subject, it being what is called "common knowledge." On the other hand, I found it one of the most difficult matters in the examination of a patient. Every genuine sensation has a physical cause in its production, and these sensations have a connexion direct or indirect with the disease from which the patient is suffering. In a great many cases they are the only signs of the presence of a disease, so that if we would find out what was the matter with our patient we have to understand the nature of the patient's sensations. Would it be believed that up to recently no serious attempt had ever been made to investigate a patient's sensations? Take, for instance, the simple sensation of an unusual beating of the heart, which the patient may call palpitation. Hitherto the clinician might make a note that the patient had palpitation, unaware that if he understood the meaning of that single sensation he would get the clue to the man's trouble. But no physician in the past had any conception of how to bring to light the information behind the patient's sensations, and he did not know how so set about acquiring that knowledge. This is how I attempted to get a knowledge. As a general practitioner I had the opportunity on many occasions of seeing patients when they had an attack of what they called palpitation. I carried with me a sphygmograph and obtained a record of the pulse during the attack. I carefully inquired of the patient what his sensations were during the time he was suffering from an attack. I found from my records that the heart acted in a variety of ways during the palpitation, and as time went on I was able to refer the different ways of acting to different abnormal states. I was able to co-relate the sensations of the patient with these different states, so that now when a patient tells me he has attacks of palpitation I put such questions to him which bring out certain peculiarities which enable me to recognise, in the majority of cases, the nature of the attack and its cause. As the causes of palpitation are varied, some directly due to affection of the heart, others due to affections of other organs, and others due to the general state of health, I learnt to differentiate many of them, and was led to detect obscure disease in other organs. I cite this as an example of the methods I had to pursue to understand the meaning of each individual sensation, and the reader will surely recognise that in no other way could we get the necessary knowledge. But it will be seen before I was able to understand the sensations I had to go through a long preliminary education. Now what I did with palpitation I did with other sensations, as the sense of exhaustion, breathlessness, pain, and so forth. I was always careful to note the condition of the heart and accompanying phenomena, so that when I describe my view of heart failure it will be understood that my conclusions were not based upon superficial and casual observations.

There was another point that came out of this method of investigation—viz., that the onset of disease is first heralded by the patient's sensations. Long before physical signs are evident the patient is conscious there is something amiss. It follows, then, that if we are ever to be able to recognise the early stages of disease we must be able to interpret the patient's sensations. In order to acquire that knowledge we must go through a preliminary education after the fashion I have described in my attempt to understand palpitation. When Sir Clifford Allbutt enumerates a number of diseases on which great strides have been made in the

knowledge of the early stages, I reply with conviction that this so-called progress is more apparent than real, and that no such progress can take place until the patient's sensations are understood, and towards that end no physician has ever educated himself or been educated to be able to appreciate the significance of a patient's sensations. Take gastric ulcer, for instance—a patient's sensations here are the earliest guide. He may have heart-burn. What is heart-burn? Neither Sir Clifford Allbutt nor any other physician has the remotest idea of the mechanism underlying its production. Or take pain—the elementary knowledge for understanding pain is not yet known to the profession. We even do not know what tissues are capable of producing pain. So long as we are so profoundly ignorant of the meaning of this sensation, so long will we fail to make the slightest progress in our knowledge of the early stages of disease. The man who says we possess sufficient knowledge wilfully shuts his eyes to the light and the truth is not in him.

This leads on to a still more important matter calling loudly for a new conception and practice in the teaching of medicine. What I have said about the patient's sensations being the earliest sign of disease will, I think, scarcely be contested. Now it is the earnest desire of everyone to detect disease at the earliest possible moment, as it is then most amenable to treatment. From what I have said it will be gathered that the recognition of the patient's sensations is the most difficult part of the examination and the knowledge can only be acquired after a great deal of experience and years of study.

Consider the attitude of the hospitals towards this subject. Disease in its earliest and most curable stages, before there is a physical sign, while yet there is but the patient's sensation to tell he is ill, is practically relegated to the out-patient department. Disease when it is so far advanced as to produce a physical sign, which means usually damage to the tissues, and is therefore beyond the stage of cure, is admitted to the hospital wards. I put the matter broadly, though here and there exceptions may be found, but any observing person will admit its truth. To recognise a physical sign is comparatively easy; to recognise the patient's sensations is extremely difficult. To whom does custom allocate the division of work? The easily recognised stage of disease is given to the experienced physician, whereas that stage most hopeful for treatment, but where the symptoms are the most difficult of recognition, is handed over to the young and inexperienced junior!

Does not such a glaring anomaly call for a reform? Can the ideas which countenance and permit such a condition of affairs be right? Does it not show clearly that the present-day conception of clinical medicine is altogether wrong, and that a renaissance in medicine is urgently called for?

How is this to come about? I must confess I have no hope whatever in the old school. They have been so long in the bonds of tradition that it is impossible for them to understand a new conception. My hope is in the younger men who are not yet crippled. If the younger teachers will take as their guide this principle: Never teach things which are given you only on authority. Before you teach your students a simple fact, verify it from your personal experience, or search in the writings of your authorities for their reasons in making a statement. Weigh these reasons carefully, and let not the weight of the reputation of the authority affect the balance, but be guided dispassionately by the facts he produces in evidence.

I am, Sir, yours faithfully,

London, August 11th, 1917. J. MACKENZIE.

THE ACTIVITY OF CERTAIN FERMENT PREPARATIONS.

To the Editor of THE LANCET.

SIR,—In the course of a research on the coagulation of the blood it was necessary to use various preparations of ferments. Some eight preparations of trypsin, five of papain, and two of rennin were tested and found to possess varying degrees of activity. The first four trypsins were Messrs. Benger's Liq. Pancreaticus and Pancreatin (solid) and Messrs. Allen and Hanburys Liq. Tryps. Co. and Trypsin (solid). All samples of these four extracts were found to be thoroughly effective and active preparations, the different methods of extraction conferring on each special advantages. On the other hand, a solid trypsin bearing a well-known American name and purchased from a leading pharmaceutical chemist in London had little activity, while three other specimens of solid trypsins bought locally were practically without tryptic action. Four papain powders, for which large prices were charged, were found to have no digestive activity, and a papaw fruit which was obtained from Durban and arrived in a slightly mouldy condition also proved to be without action when tested. Of the two rennins, one was Messrs. Benger's and was an exceedingly active coagulant of milk, but a tabloid preparation of this ferment, bearing the name of the American firm already referred to in connexion with a trypsin, was found to be inactive. This is remarkable when one remembers how easily a rennin effect is obtained and how many ferments can coagulate milk. The experience, as a whole, shows how necessary it is to test preparations of ferments before assuming that they have the characteristic activity. I learned from one large firm that they had found most papain preparations on the market to be without action, and my own limited experience bears this out.

The research referred to dealt with the coagulation of the blood and was not concerned directly with the estimation of the value of various ferment preparations. It will appear in the *Journal of Physiology*.

I am, Sir, yours faithfully,

August 9th, 1917. W. NEVILL HEARD.

AGGLUTINATION TESTS IN TYPHOID FEVER, ETC.

To the Editor of THE LANCET.

SIR,—May a humble and undistinguished searcher after pathological truth venture to interpose in the agglutination controversy which enlivens your columns from time to time? There can be no doubt that the Oxford School has done valuable service to clinical pathology in pointing out the errors of those who condemn any agglutination method as useless in the diagnosis of the enterica group in these days of T.A.B. inoculations, and of those who maintain that a single positive reaction is diagnostic even in inoculated persons. It has also substantiated the value of the drop-pipette method as against the more tedious volumetric method with graduated pipettes. But there, I am inclined to think, their real service has come to an end. Whether standard-agglutinin-unit estimation has any future in more exact research work (as Captain Ainley Walker suggests in THE LANCET of Nov. 25th, 1916), I will not judge; but in my opinion it is, for many reasons, unsuitable and unnecessary where a large number of sera have to be tested, and especially as a method for use outside the laboratory. Agglutination tests should be within the scope of every practitioner who wishes to do some, at least, of his own clinical pathology, but it is obvious he will acquire the simplest technique which will give reliable results. In the laboratory some pathologists habitually turn over all the agglutination work, and even the readings, to an attendant; others prefer to take the responsibility only of their own work. In the laboratory work of a general hospital—at any rate a military hospital—there is no time for ultra-elaborate technique. Only the proved unreliability of all other methods could justify the use of the Oxford technique as a general method.

Has the Oxford School proved all other methods to be unreliable? Not at all. After all, the essential point of the Oxford technique—not the only one, but the essential one—is the repeated examination of the patient's serum by the same technique. The personal equation comes in in the reading of "the highest dilution in which marked agglutination (without sedimentation) can be detected" (which is *standard agglutination*, according to the Oxford directions), just as in any other method. And when it comes to nine possible readings,[1] followed by mathematical calculations from an arbitrary key of values, and averages struck from these, then I think the possibility of error must be much increased, and in any case the burden becomes intolerable. This is surely wholly unnecessary. "Agglutinin units" are in danger of becoming a fetish. A rise or fall of agglutinin content is the same whether in units or titre if the same

[1] Dreyer and Inman, THE LANCET, March 10th, 1917.

method is used by the same observer, and if the serum dilutions are not too widely separated (which applies to any method) a curve can be plotted out equally well in both cases. The important matter is to use the same technique and the same emulsion of known sensitiveness in each case. There is no difficulty about this if a good strain of organism is kept properly subcultured and a fresh batch of emulsion made about every two months, such fresh emulsion being tested at intervals against a known high-titre serum.

I am, Sir, yours faithfully,

ARTHUR H. PRIESTLEY,
Captain, R.A.M.C.

Aldershot, August 8th, 1917.

THE ADMINISTRATION OF EMETINE.

To the Editor of THE LANCET.

SIR,—Emetine is being utilised so largely in treatment that it may be worth while to draw attention to a better method of administering it than that generally employed at present. Since emetine was first advocated by Sir Leonard Rogers in the treatment of amœbic dysentery, it has always been given hypodermically. Dixon ("A Manual of Pharmacology," fourth edition) states:—

> If ipecacuanha is injected subcutaneously, pain and inflammation, followed by suppuration and the formation of an abscess, are produced at the seat of inoculation. ..... The action of cephaeline and emetine is the same as that of ipecacuanha.

In actual practice, the subcutaneous injection of emetine and its allied alkaloids does not produce abscesses at the sites of inoculation except in a small percentage of cases. There is always, however, great pain, with redness, swelling, and induration, which is often so deep-seated that muscular movement becomes an agony. Local tenderness is often very acute, and I have had several cases where the patient refused further emetine injections after the first one or two because of the pain, and I sympathised with them. It has also to be remembered that dysentery is sometimes followed by neurasthenia, and the patient is not disinclined in these cases to put the blame for his woes on the emetine.

The method of administration that I have adopted and find most satisfactory is intra-muscular injection. The best sites are on the upper arm over the deltoid and in the gluteal region. A prolonged course of treatment can be given in this way without causing any inconvenience to the patient. There is no pain and sometimes only a little tenderness at the site of injection 24 hours afterwards. Injections can be given on alternate arms day by day. Summarised briefly, the advantages of the intra-muscular method are as follows: 1. Pain during inoculation is limited to the prick of the needle. 2. After-pain is generally absent, and when present disappears within 24 to 48 hours. 3. There is no tenderness, swelling, induration or discolouration of the skin, and scarring is minimal or absent. 4. The efficacy of the drug may be increased, as there is probably less precipitation through more rapid absorption. 5. The same site of inoculation may be used repeatedly at intervals of 48 hours.

I am, Sir, yours faithfully,

P. FIGDOR, M.B., Ch.B. Glasg.,
Temporary Captain, R.A.M.C.; Late Temporary Physician to Out-patients, City of London Hospital for Diseases of the Chest, and Assistant Medical Officer, North-Eastern Hospital.

Lucknow, India, July 24th.

THE EXPECTATION OF LIFE IN AORTIC REGURGITATION.

To the Editor of THE LANCET.

SIR,—In his letter to THE LANCET of August 4th Sir Clifford Allbutt, referring to a statement by Sir James Mackenzie that a man with aortic regurgitation may reach his "normal span," exhibits his scepticism of the accuracy of that statement by remarking that were Sir James Mackenzie a writer of less authority he would boldly answer "Never." It seems that the case of longest duration of life from the establishment of an aortic regurgitation which he (Sir Clifford Allbutt) has witnessed was 23 years, and that the patient died quite suddenly at the age of 55. It may therefore be of interest to your readers to know that I am now in attendance on a lady who is 72 years of age, and has in all probability had aortic regurgitation for the last 50 or 60 years. She had a mild attack of rheumatic fever at the age of 14, and a second, which she describes as a bad attack, at the age of 18. She was then under the care of the late Dr. Robinson, of Newbury, who informed her of the fact that she had "a weak heart," a statement which was subsequently confirmed by the late Dr. Wilks, of Ryde, Isle of Wight, "40 years or more ago." For the last 10 years she has been under the care of my partner, Dr. W. H. Fawcett, who has observed the condition of the heart on many occasions, and who is thus able to confirm the diagnosis of aortic regurgitation, a condition which has led to only a very moderate degree of hypertrophy and dilatation of the left ventricle, and which has given rise to no symptoms other than occasional attacks of giddiness and faintness. I might add that the only other illness from which the patient has suffered was an attack of diphtheria at the age of 22, but, as Sir William Osler remarks, "Simple endocarditis in diphtheria is rare," whilst in rheumatic fever it is exceedingly common. She probably owes the immunity which she has enjoyed hitherto to the fact that she has remained single, and has never been obliged to undertake any hard physical exertion. Needless to say, I look upon this case as the exception which proves the rule, and the rule is too well known to need reiteration.

I am, Sir, yours faithfully,

J. STANLEY AVERY.

Bournemouth, August 8th, 1917.

URBAN VITAL STATISTICS.

(Week ended August 4th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 10·3 per 1000, which is 0·9 per 1000 less than that recorded in the previous week. In London, with a population exceeding 4,000,000 persons, the death-rate was 10·3, or 0·1 per 1000 below that in the previous week; among the remaining towns the death-rates ranged from 3·9 in Ilford, 4·4 in Enfield and in Great Yarmouth, and 5·2 in Grimsby to 15·7 in Blackpool, 16·8 in Carlisle, 17·3 in Rotherham, and 17·5 in Southampton. The principal epidemic diseases caused 287 deaths, which corresponded to an annual rate of 0·9 per 1000, and included 107 from infantile diarrhœa, 95 from measles, 39 from diphtheria, 37 from whooping-cough, 4 from scarlet fever, and 5 from enteric fever. The deaths from diarrhœa were 12 above the number in the previous week, and included 28 in London, 13 in Liverpool, 11 in Manchester, and 10 in Birmingham. Measles caused the highest death-rates of 2·4 in Northampton and 2·7 in York. The 625 cases of scarlet fever under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 26 fewer than the number in the previous week; the 1111 cases of diphtheria showed an increase of 30. Of the 3357 deaths from all causes in the 96 towns 133 resulted from violence. The causes of 29 deaths were uncertified, of which 7 were registered in Birmingham, 6 in Liverpool, and 2 each in Warrington, Barrow-in-Furness, and Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was 10·8, against 12·5 and 12·9 per 1000 in the two preceding weeks. The 240 deaths in Glasgow corresponded to an annual rate of 11·2 per 1000, and included 14 from whooping-cough, 8 from infantile diarrhœa, and 6 from measles. The 75 deaths in Edinburgh were equal to a rate of 11·5, and included 2 from measles and 1 each from whooping-cough, diphtheria, and infantile diarrhœa.

Irish Towns.—The 113 deaths in Dublin corresponded to an annual rate of 14·8, or the same as the rate in the previous week, and included 14 from infantile diarrhœa, 2 from whooping-cough, and 1 from enteric fever. The 84 deaths in Belfast were equal to a rate of 11·1 per 1000, and included 2 from infantile diarrhœa, and 1 each measles and whooping-cough.

(Week ended August 11th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 10·4 per 1000, and was 0·1 more than that in the previous week. In London, with a population exceeding 4,000,000 persons, the death-rate was 10·3, and coincided with that recorded in the previous week; among the remaining towns the death-rates ranged from 4·1 in Walthamstow, 4·4 in Barrow-in-Furness, 4·9 in Willesden, and 5·5 in Wakefield, to 16·1 in Dewsbury, 16·7 in Dudley, 17·6 in Oxford, and 17·7 in Hastings. The principal epidemic diseases caused 328 deaths, which corresponded to an annual rate of 1·0 per 1000, and included 180 from infantile diarrhœa, 78 from measles, 31 from whooping-cough, 29 from diphtheria, 6 from scarlet fever, and 4 from enteric fever. The deaths from diarrhœa were 221 in excess of the number in the previous week, and included 67 in London, 16 in Liverpool, 10 in Manchester, 9 in Birmingham, and 8 in West Ham. Measles caused the highest rates of 2·7 in Stockton-on-Tees and 3·6 in Northampton. The 633 cases of scarlet fever under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 8 above the number remaining at the end of the previous week; the 1071 cases of diphtheria showed a decrease of 40. Of the 3394 deaths from all causes in the 96 towns 111 resulted from violence. The causes of 29 of the deaths were uncertified, of which 6 were registered in Birmingham, 4 in Liverpool, 3 in St. Helens, and 2 each in Leicester and Manchester.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate was 11·2, against 12·9 and 10·8 per 1000 in the two preceding weeks. The 242 deaths in Glasgow corresponded to an annual rate of 11·3 per 1000, and included 17 from infantile diarrhœa, 9 from whooping-cough, and 7 from measles. The 71 deaths in Edinburgh were equal to a rate of 11·2 per 1000, and included 1 each from whooping-cough and infantile diarrhœa.

Irish Towns.—The 115 deaths in Dublin corresponded to an annual rate of 15·0 per 1000, and included 18 from infantile diarrhœa, 2 from diphtheria, and 1 each from measles and whooping cough. The 88 deaths in Belfast were equal to a rate of 11·7 per 1000, and included 1 each from measles, whooping-cough, and infantile diarrhœa.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. H. A. Harris, R.A.M.C., attached Royal Field Artillery, was educated at Cambridge and at St. Bartholomew's Hospital, London, and qualified in 1910. He was in practice at Putney, London, prior to joining the R.A.M.C.

Capt. A. S. Taylor, R.A.M.C., attached Highland Light Infantry, qualified at Edinburgh in July, 1914, and joined the R.A.M.C. soon after the outbreak of war.

Capt. B. M. Hunter, R.A.M.C., attached Cambridge Regiment, qualified at Glasgow in 1909, and for a time practised at Consett, Co. Durham, and afterwards at Stevenston, Ayrshire.

Capt. W. R. Aspinall, M.C., Australian Army Medical Corps.

Major W. D. Kirkland, M.C., Australian Army Medical Corps.

Surgeon-Probationer A. M. Horsey, R.N.V.R.

Died of Wounds.

Capt. R. W. Shegog, R.A.M.C., qualified at Dublin in July, 1915, and joined up shortly afterwards.

Capt. N. G. Chavasse, V.C., M.C., R.A.M.C., attached to the Liverpool Regiment, was educated at Oxford and at Liverpool University, and qualified in 1912. He was a well-known athlete at Oxford, and prior to the war he was medical officer at the Royal Southern Hospital, Liverpool. The award of the M.C. was recorded in THE LANCET of Jan. 22nd, 1916, p. 215, and of the V.C. in THE LANCET of Nov. 4th, 1916, p. 806.

Died.

Fleet-Surg. E. C. Ward, R.N., was educated at Queen's College, Cork, and at Edinburgh University, and qualified in 1883. He died at the Royal Naval Hospital, Chatham.

Wounded.

Capt. W. B. Allen, V.C., M.C., R.A.M.C.
Capt. H. R. Partridge, M.C., R.A.M.C.
Lieut. D. S. Pracy, R.A.M.C., attached Liverpool Regiment.
Capt. H. Robinson, R.A.M.C., attached Liverpool Regiment.
Capt. T. D. Renwick, R.A.M.C.
Capt. D. D. Craig, M.C., R.A.M.C., attached E. Lancs. Regt.
Capt. W. E. David, M.C., R.A.M.C., attached Cameron Highlanders.
Capt. E. Evans, R.A.M.C.
Lieut. G. L. Gall, R.A.M.C.
Capt. D. McVickers, R.A.M.C., attached Coldstream Guards.
Capt. J. Ross, R.A.M.C., attached King's Royal Rifle Corps.
Capt. F. B. Chavasse, R.A.M.C., attached Liverpool Regiment.
Capt. F. S. Fletcher, R.A.M.C.
Capt. I. C. MacLean, M.C., R.A.M.C., attached Rifle Brigade.
Capt. G. C. Robinson, R.A.M.C., attached Liverpool Regt.
Capt. J. Warwick, R.A.M.C., attached Liverpool Regiment.
Capt. C. W. Treherne, R.A.M.C.
Capt. J. P. Charles, R.A.M.C., attached Herts Regiment.
Capt. W. S. Wallace, R.A.M.C.

Missing.

Lieut. J. Rickards, R.A.M.C., attached Royal Scots.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Capt. P. F. C. d'E. Wheeler, Dorset Regt., attached to the Royal Flying Corps, killed whilst flying in England, eldest son of Capt. P. C. E. d'E. Wheeler, R.A.M.C., of Worthing.

Second Lieut. T. M. O'Neill, Royal Flying Corps, severely injured whilst flying in France, son of the late Dr. H. O'Neill, J.P., of Belfast.

Capt. J. L. Strain, Royal Garrison Artillery, killed in action, eldest son of Dr. W. L. Strain, of Wimbledon-hill, London, and formerly of São Paulo, Brazil.

Capt. H. Chronnell, M.C., Loyal North Lancs. Regiment, killed in action, only son of Dr. J. Chronnell, of Hindley, Lancs.

Second Lieut. W. F. Francis, Hertfordshire Regiment, killed in action, third son of Dr. L. A. Francis, of Uxbridge, Middlesex.

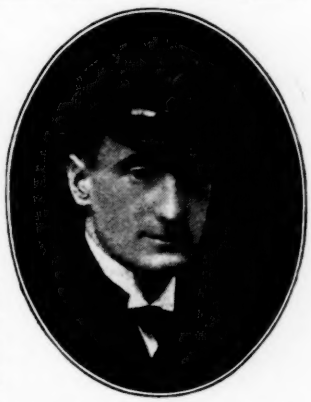
Second Lieut. J. J. F. Shand, Royal Garrison Artillery, killed in action, only son of Fleet-Surgeon J. Shand, R.N.

Second Lieut. A. H. W. Beatty, Manchester Regiment, killed in action, eldest son of Dr. J. B. H. Beatty, of Harrow, Middlesex.

OBITUARY OF THE WAR.

EDWARD RAYNER, M.B., B.C. CAMB., F.R.C.S. ENG., SURGEON, ROYAL NAVY.

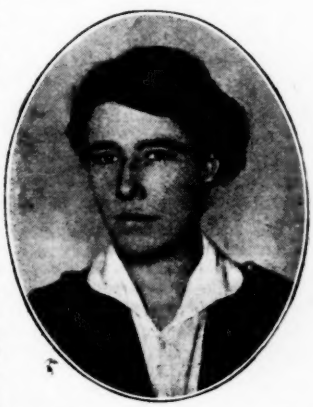
Surgeon E. Rayner, who was killed in the explosion which destroyed the *Vanguard*, aged 31 years, was elder son of the late Edward Rayner, of Wadhurst, Sussex. Educated at Heddon Court and the South-Eastern College, Ramsgate, at both of which he was conspicuous in sports, he entered Pembroke College, Cambridge, taking a first-class in the Natural Science Tripos in 1908, and completing his medical studies at St. Thomas's Hospital. After taking his M.B., B.C. Camb., in 1912 he acted as house surgeon and casualty officer at his hospital while working for the F.R.C.S. When war broke out he offered his services to the Admiralty, and was sent to Gallipoli with the R.N. Divisional Engineers. He saw the campaign through from start to finish, suffering himself from epidemic jaundice and becoming seriously ill after the evacuation. Last autumn, after his recovery, he was appointed surgeon to the *Vanguard*, where he remained until his death.



A consulting surgeon with the armies writes of Surgeon Rayner: "I knew him well and had a high opinion of his ability and sound surgical judgment. I heard from various sources of his fearless and devoted conduct." Others speak of his cheery outlook on life—one who never complained of the monotonous life on board a battleship, but was always an excellent messmate and companion.

MARIAN ELIZABETH WILSON, M.B., CH.B. EDIN., SURGEON TO THE SCOTTISH WOMEN'S HOSPITAL AT ROYAUMONT.

Dr. Marian Wilson, who died on August 1st, was surgeon to the Scottish Women's Hospital, Hôpital Auxiliaire 301, Royaumont, France. Her death was due to an attack of acute appendicitis, occurring at St. Martin-Vésubie, Alpes Maritimes, where she was taking a few weeks' rest. Miss Wilson belonged to a Scottish family, studying medicine at Edinburgh, where she graduated in 1906. After holding the post of medical officer to York Dispensary, she spent several years in Palestine as a medical missionary at Jaffa and Hebron. On the outbreak of hostilities Miss Wilson went to Lausanne, where she had already lived for several years, thus acquiring a complete mastery of the French language, and in November, 1915, she joined the staff of the Royaumont hospital, where her surgical experience and conscientious work made her a most valuable colleague. Her devoted services to the French wounded were recognised in February, 1917, when the French Government awarded her the Médaille des Epidémies en vermeil.



Her chief at the Royaumont hospital writes of Miss Wilson: "Her personal charm and her solicitude for her patients gained her their affection in an unusual degree, and after their return to the front they not infrequently walked many miles

and spent many hours of their short leave in paying her a visit. In spite of a frail physique, with an admirable spirit Miss Wilson rose to the occasion during many periods of stress and fatigue. The news of her untimely death has caused the deepest sorrow to her friends and comrades, in whose ranks her loss has created an irreparable gap."

THE HONOURS LIST.

The following awards to and promotions of medical officers are announced:—

Distinguished Service Order.

Staff-Surgeon Gilbert Bodley Scott, R.N.

In recognition of his services with a Naval Armoured Car Squadron in France, Russia, Turkey, and Roumania. On active service he has shown a devotion to duty and a forgetfulness of self which cannot be too highly praised.

To be Brevet-Colonels.

A.M.S.—Brig.-Surg. Lt.-Col. J. F. Beattie, ret. list.

R.A.M.C.—Lt.-Col. C. Averill; Lt.-Col. H. L. Battersby, ret. pay; Lt.-Col. J. P. Bull, C.M.G.; Lt. Col. H. Charlesworth, C.M.G., ret. pay; Lt.-Col. C. P. Childe; Lt.-Col. A. M. Connell; Lt.-Col. H. E. Deane, ret. pay; Lt.-Col. A. Dodd, ret. pay; Lt.-Col. A. B. Gemmel; Lt.-Col. T. Gowans; Lt.-Col. L. K. Harrison; Lt.-Col. H. P. Hawkins; Lt.-Col. T. H. Haydon; Lt.-Col. A. G. Kay, ret. pay; Lt.-Col. J. Marnoch, C.V.O.; Lt.-Col. F. Marsh; Lt.-Col. W. J. Maurice; Lt.-Col. R. R. H. Moore, ret. pay; Lt.-Col. and Hon. Surg. Col. A. Napier; Lt.-Col. D. V. O'Connell, ret. pay; Lt.-Col. S. P. Phillips; Lt.-Col. J. A. Rooth; Lt.-Col. J. W. Smith; Lt.-Col. C. J. W. Tatham, ret. pay; Lt.-Col. H. J. Waring; Lt.-Col. H. W. Webber; Lt.-Col. F. H. Westmacott; Lt.-Col. W. H. White; Lt.-Col. G. S. Woodhead.

To be Brevet-Lieutenant-Colonels.

R.A.M.C.—Maj. T. D. Acland; Maj. D. T. Belding; Maj. (temp. Lt.-Col.) R. A. Bolam; Maj. C. R. Browne; Maj. (temp. Lt.-Col.) W. Butler; Maj. A. Butler-Harris; Maj. J. H. Drysdale; Maj. C. H. Fagge; Maj. T. A. M. Forde; Maj. T. Forrest; Maj. W. M. Gabriel; Maj. J. W. Gill; Maj. H. W. Laing; Maj. P. W. Lamballe; Surg.-Maj. R. E. Lauder; Maj. (actg. Lt.-Col.) C. A. Lees; Maj. A. P. Luff; Maj. (temp. Lt.-Col.) A. B. Prowse; Maj. D. Rennet; Maj. B. M. H. Rogers; Maj. (temp. Lt.-Col.) C. Rundle; Maj. J. E. H. Sawyer; Maj. (temp. Lt.-Col.) J. Smart; Maj. H. Stott; Maj. D. Wallace, C.M.G.; Maj. G. W. Watson; Maj. F. E. A. Webb; Maj. J. Wilson.

Late R.A.M.C.—Maj. H. A. Berryman, ret. pay, R. of O.; Maj. C. E. P. Fowler, ret. pay, R. of O.

To be Brevet-Majors.

R.A.M.C.—Capt. S. T. Beggs, R. of O.; Capt. J. A. Bennett; Capt. (temp. Maj.) W. C. Bosanquet; Capt. (temp. Maj.) D. W. Boswell; Capt. C. R. Box; Capt. R. C. Elmslie; Capt. J. Ewing; Capt. J. Fawcett; Capt. (temp. Lt.-Col.) E. H. Fenwick; Capt. (temp. Maj.) E. S. Forde; Capt. (temp. Maj.) R. L. Guthrie; Capt. W. Guy; Capt. H. F. Horne; Capt. J. L. Joyce; Capt. (temp. Maj.) H. A. Leebody; Capt. J. N. McLaughlin, Spec. Res.; Capt. A. W. Ormond; Capt. (temp. Lt.-Col.) H. M. Rigby; Capt. C. W. Rowntree; Capt. A. Sellers; Capt. H. Sharpe, Capt. E. G. Smith; Capt. N. W. Stevens; Capt. H. H. Taylor; Capt. A. Walker; Capt. T. H. Ward, Capt. W. J. Wilson.

FOREIGN DECORATIONS.

Italian.

Order of St Maurice and St. Lazarus: Officer.—Fleet-Surg. A. R. H. Skey, R.N.

Order of the Crown of Italy: Officer.—Fleet-Surg. E. T. P. Eames, R.N.

Japanese.

Order of the Rising Sun: 2nd Class.—Surg.-Gen. G. Welch, R.N.

THE CENTRAL MEDICAL WAR COMMITTEE AND THE COMMITTEE OF REFERENCE OF THE ENGLISH ROYAL COLLEGES.

The Forthcoming Committee of Inquiry into the Working of the Army Medical Service.

The following resolution was passed by the Central Medical War Committee on August 15th, 1917, for transmission to the Prime Minister, the Secretary of the War Cabinet, the Secretary of State for War, and the Director-General of the Army Medical Service:—

The Central Medical War Committee understands from reports of the proceedings in Parliament that the Government has in contemplation the appointment of a small Committee of Inquiry into the practical working of the Army Medical Service in the field. The Committee welcomes this announcement, believing from statements made to it that such an inquiry is certainly advisable and is calculated to allay much unrest. The Committee trusts, however, that the inquiry will be extended to include the working of the Service in this country. The Committee suggests that in view of the difficulty of supplying from the civil community more doctors for the Army the reference to the Committee of Inquiry should include the duty of instituting a careful comparison between the medical needs of the civil community and the Army respectively. The Central Medical War Committee would venture to urge that, in view of the responsibility which has rested on it of selecting from civil practice the bulk of the doctors now serving in the Army, the Committee of Inquiry should include representatives of the Central Medical War Committee.

The Constitution of Recruiting Boards.

The constitution of recruiting boards and the future requirements of the civil and military medical services were the subjects debated by a special joint meeting of the Central Medical War Committee and the Committee of Reference of the English Royal Colleges on the same day. A report of the joint committee upon the constitution of these boards was submitted, which assumed that whatever Government Bureau became the authority the whole organisation of recruiting for the Army would be handed over to a civil department, and which laid stress on the importance of providing that the personnel of the medical recruiting boards should consist of doctors whose position and experience gave some assurance that the medical examinations were conducted in an efficient and uniform manner. The meeting decided that the report and the scheme, which is a most carefully thought-out document, should be sent to the Prime Minister, the War Office, the Local Government Board, the National Insurance Commission, and the Chairman of the Select Committee of the House of Commons now taking evidence about recruiting.

PERMANENT COMMISSIONS IN THE R.A.M.C.

WE have received a letter from a correspondent signing himself "Pater," criticising the present system of granting commissions in the R.A.M.C. Born and bred himself in the old Army Medical Department his eldest son entered the profession with the hope of following in his father's and grandfather's footsteps. The letter goes on:—

He became qualified from my old hospital in September, 1914, and in the ordinary course of events would have entered for the R.A.M.C. examination in November of that year, hoping thus to make a good start when young. He was told then that the examination for commissions in the R.A.M.C. was suspended, and that his only way of entering the Service was by accepting a commission in the Special Reserve. This he did, and has been serving with a Field Ambulance in France for over two years now, with the rank of Captain. He has repeatedly tried to obtain a regular Commission, but so far without success. I have written more than once to the War Office explaining the circumstances, but the reply has always been that no commissions are being given in the ordinary way during the war. And yet commissions *are* being given. It really appears to come to this, that during the war the old system of examination has been superseded by a system of selection in which, of course, interest of all sorts is bound to have weight. But it seems rather hard that a young man who had from his school days devoted all his energy to entering the R.A.M.C. and might have gained his commission by examination three years ago, should still be waiting, *and losing seniority*, because he joined up at once in the only possible way and has been on active service ever since.

Our correspondent's disappointment will, we feel sure, meet with a sympathetic hearing; but it is not in our experience that interest is now the chief factor in securing regular commissions. A fair number of young officers have been selected for permanent commissions on the grounds of work, age, and other objective considerations. The number is, however, greatly larger from which selection has to be made, and individual disappointment can hardly be avoided.

ANKYLOSTOMA IN THE AMERICAN ARMY.

IN the *Military Surgeon* (Washington, D.C.) for July is an interesting paper by Major J. F. Siler and Major C. L. Cole, both of the Medical Corps of the United States Army, on the prevalence of ankylostoma in one cavalry and two infantry regiments from the Southern States. The fæces of 2704 soldiers were examined. A dozen bowls were issued. In each was placed a square of glazed paper. On this the fæces were deposited, and with a small spoon attached to the cork, which stoppered a glass tube, a specimen was taken, and returned to the glass tube on which was written the name of the soldier. The glazed paper, with the fæces on it, was caught up by its four corners and dropped into the latrine trench. The fæces were microscopically examined. If the first slide proved negative, a second was examined. This very neat method greatly facilitated the valuable research these officers made, for they could do up to 250 examinations in a day. They found that a Texas infantry regiment had 6 per cent. infected, and an infantry regiment from Mississippi 32, while in a cavalry regiment from Alabama 54 per cent. of the personnel were harbouring the ankylostoma. It is concluded that the cases in the Texas regiment had come from outside the State, and that the others had probably incurred infection at home. The parasite was more often found in men from rural districts. Nothing is said about the condition of

these men as regards anæmia, or of any evidence of the disease they presented to the naked eye, but it was found that the two regiments most affected were the two mentioned in the *Military Surgeon* for June[1] as suffering exceptionally from measles through want of patient precaution. Perhaps their neglect of sanitary precaution was due to the helminthiasis and its consequent anæmia having reduced the moral energy of these commands. At any rate, in these two regiments the men who had hookworms were attacked by measles twice as numerously as the others, and also suffered far more from complications. This is an observation of great importance, for it gives statistical support to the popular impression that liability to infectious disease is greater for contacts already out of health. If all United States Southern troops are similarly affected with ankylostoma they will be an anxiety to any country in which they go campaigning, and the greatest care must be taken in disposing of their excreta.

THE SUPPLY OF MEDICAL MEN IN NEW ZEALAND.

A New Zealand Special Correspondent writes: New Zealand, in common with the Old Country and the other oversea dominions, has been since the beginning of the war exercised as how best to use the medical men practising in the dominion. A large number of men volunteered at the outset of the war, and, alas, many have been killed. The desire of the doctor to get to the front and to help in the great struggle has brought about hardship in some of the country districts, and quite recently the Government has undertaken the task of allotment of medical material between the military authorities and the civil population.

The National Efficiency Board here has classed the medical profession as one of the most essential of occupations. Already out of 723 men on the Register at the beginning of the war 257 are on military service at home or abroad. Among the recommendations made were the following:—

That a board be set up of representative medical men from all the Dominion to hear all appeals against military service made by medical men and to make recommendations to the Government.

That the services of any applicant for registration under the Medical Acts should be placed first at the disposal of the Defence Minister and if not needed by him then at that of the Health Department, and that agreement to such disposal should be a condition of registration.

That during the war men should not be allowed to change their location.

The Minister proposes to introduce an Act of Parliament to give power to the Government to mobilise the whole profession so that they may be sent to any part of the Dominion which the Minister of Public Health may think fit. This is regarded as being unfair to the profession, in that no other trade or calling has, up to now, been mobilised for *home service*. There is no doubt that in some of the outlying districts there is a scarcity of medical men, but this scarcity has obtained for long before the war and the Government has been in the habit of offering premiums to men to settle in these places. It is suggested by the medical profession that the Government should extend this system, and grant, say, an honorarium of £560 (captain's pay) per annum, with travelling allowances. Where a medical man is called up by a ballot from a district that would be unduly denuded of medical help if he went into camp, his place might be taken by a man from a better supplied centre. At one of the recent sittings of the Military Appeal Boards the inspector of hospitals appeared in support of an appeal for exemption by a medical man in one of the country districts. Asked by the military assessor, "May we take it that you will appeal whenever you think that the safety of the outlying places is likely to be jeopardised by the doctor being take from the district?" "Yes." "And if you do not appear we may take it that the man can be spared?" "Yes." It would seem from this that agreement between the medical profession and the Government has in a measure been anticipated, but it is to be hoped that the *pourparlers* which are taking place will result in a way that will at once be fair to the country and the profession.

DOCTORS OF MILITARY AGE.—The Local Government Board of Ireland has now sanctioned doctors of military age for civil work in the sanitary service, and the appointment of Dr. D. F. Murnaghan as temporary medical officer of Omagh, No. 11 Dispensary District, is allowed at a rate of payment of 4 guineas weekly.

[1] THE LANCET, July 21st, 1917.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Sir W. Watson Cheyne.

Sir W. WATSON CHEYNE took his seat in the House of Commons on Monday, August 13th, as Member for the Universities of Edinburgh and St. Andrews.

Select Committee on Medical Examinations.

Mr. MACPHERSON, Under Secretary for War, appeared as a witness on Thursday, August 9th, before the Select Committee of the House of Commons, which is inquiring into medical examinations and re-examinations for the Army in particular under the Military Service (Review of Exceptions) Act, 1917. Mr. SHORTT was in the chair.

Mr. MACPHERSON stated that he had held the office of Under Secretary since December last. He had assured the House of Commons on more than one occasion that no secret instructions had been issued with regard to the number of rejections of recruits. He had on those occasions addressed inquiries on the subject to a department at the War Office, which obtained the requisite details, and he had to rely on that department. He was assured that no instructions, oral or other, were issued except under Army Council instructions.

The CHAIRMAN: You have undoubtedly read the secret instructions?

Mr. MACPHERSON: I have since this Committee began its sittings. I first saw the confidential letter sent out by General Sir Alfred Keogh in print. It was not based on an Army Council instruction. It was a confidential document sent out by Sir Alfred Keogh, acting, no doubt, upon some instructions or other. I never heard of the document before I saw it in print. Such a document would not come before the civilian side of the War Office. The facts on which he based his replies in the House of Commons were invariably signed by the head of the department concerned. He was entitled to assume that the information had been got from the proper department.

The CHAIRMAN: If you had known that this document existed would you have given the same answer?

Mr. MACPHERSON admitted that he would not. He would not assent to the proposition that he had been misled. It all depended on the view which the military authorities took. They distinguished between a secret document and a confidential document. The instructions sent out to heads of departments were not looked upon by the military as secret instructions. A department had a perfect right to send out any instructions it liked so long as they dealt with the work of the department.

Mr. NIELD: I understand that your replies given in the House are based on facts supplied by the departments, you wording them in your own phraseology?

Mr. MACPHERSON: That is so.

Mr. REES: To the military mind secret instructions would only have regard to Army Council instructions?

Mr. MACPHERSON: I think so.

Education and the Health of School Children.

In his speech in introducing the Education Bill for England and Wales on Friday, August 10th, Mr. HERBERT FISHER (President of the Board of Education) made striking reference to the need of conserving the health of school children and young persons and of promoting their physical efficiency. The Bill is a comprehensive measure. It proposes, amongst other matters, to encourage the establishment of nursery schools, to abolish all exemptions from school attendance up to the age of 14, to insist upon attendance at continuation day classes up to the age of 18, when full-time education has not been received up to the age of 16. Dealing with the regulation of child labour, Mr. FISHER said: We desire a full period of school life unimpaired by the competing claims of employment for all children of the working population. At the present moment the effect of our elementary school education is greatly harmed by the work which is imposed on children out of school hours. They are liable to be employed for three hours before the school opens and for some hours after the school closes, and the general opinion of my inspectors is that of all the reforms affecting elementary education there is none more vital than the enforcement of strict limitation of the employment of children in their school-going days. This is not merely a question of scholastic efficiency. It affects the physical welfare of the race. We have now an overwhelming mass of evidence to the effect that the health of our children suffers from premature or excessive employment. You may trace the evil effects in diminished height and weight, in curvature of the spine, in cardiac affections, and in deficiency of the senses, especially the sense of vision, and in the bad dentition of our working classes. The reports of our school medical service are full

of them. Accordingly, we propose that no child under 12 shall be employed for profit, and here we have already been anticipated by by-laws passed in some of our large municipalities, and we further provide that no child under 14 shall be employed on any day on which he is required to attend school before the close of school hours or after 8 P.M. on that day, and on other days before 6 A.M. or after 8 P.M. The House will observe that under this provision a child between 12 and 14 may be employed between 6 A.M. and 8 P.M. on Saturdays and during school holidays, and although we have come to the conclusion that there is something to be said for a little employment on days on which the school provides no regular work, we are fully sensible that this liberty may be abused in the future as it has been in the past, and the Bill accordingly provides that the local education authorities, if they are satisfied, on the report of the school medical officer or otherwise, that the child is being employed in such a way as to be prejudicial to health or education, may forbid or regulate that employment. We have also come to the conclusion that if the local education authority should decide that it would be wise to continue the elementary education in elementary schools either of the boys or the girls in their area, or of boys or girls following particular occupations in that area, up to the age of 15, they shall be empowered to do so.

In regard to physical training, the right honourable gentleman said: The Government is desirous of taking this opportunity of assisting the physical education of the people in every possible way. Physical training is already an element, although perhaps not a sufficient element, in our elementary school curriculum, and grants have recently been sanctioned for organisers of physical training in our public elementary schools. The present Bill gives physical training a place in our continuation schools. Every boy and girl in those schools will receive physical training. It goes even further. It empowers the local education authority to establish nursery schools for young children, to maintain playing fields, school baths or school game-centres, and equipment for physical training, and it extends the powers and duties with regard to medical inspection now possessed by the local education authorities in the case of elementary schools and secondary schools under their control. Let us consider what this means to a girl drawn from a slum in one of our great manufacturing towns. She will be under the continued inspection and supervision of the School Medical Service. She will have the advantage of physical exercise and remedial training as well as the practical training, which will be part of the work of the continuation schools.

Colonel YATE: Is physical training provided for in the continuation school for boys?

Mr. FISHER: Certainly. The right honourable gentleman proceeded to deal with the other details of the Bill. The State, he said, had need to secure for its juvenile population conditions under which mind, body, and character might be harmoniously developed.

Welfare of the Blind.

The Departmental Committee on the Welfare of the Blind has issued its report. It states that the intervention of the State is required to secure (1) central control, organisation, and assistance for the existing agencies of voluntary help, which could be utilised with far greater effect if centrally directed; and (2) additional assistance for the blind. It is recommended that a general department whose function shall be the general care and supervision of the blind shall be set up in the Ministry of Health whenever such a Ministry shall be created, and that in the meantime it shall be set up in the Local Government Board. The report also recommends that steps should be taken to assure uniform and more effectual notification of the disease of ophthalmia neonatorum, and that immediate treatment of all cases should be secured.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 8TH.

Sir William Babtie.

Major DAVID DAVIES asked the Under Secretary for War whether the contents of the Vincent-Bingley Report of the Mesopotamia Expedition had been considered by the Army Council before the appointment of Sir William Babtie as Deputy Director-General of Army Medical Services; and, if so, what reasons could be given for his selection for this post.—Mr. MACPHERSON replied: Sir William Babtie was appointed Director of Medical Services, and not, as stated in the question, Deputy Director-General Medical Service, at the War Office on March 18th, 1916. The Vincent-Bingley report is dated "Simla, 29th June, 1916."

Mr. HOGGE: Does he retain his Indian pay?—Mr. MACPHERSON: All that I can say is that the War Office has suspended him. On the question of his pay I refer the honourable Member to the India Office.

The Army Medical Service.

Sir GARROD THOMAS asked the Under Secretary for War whether he would state what salary was paid to members of the Medical Advisory Board of the Army Medical Service; how many civilian doctors had a seat on it; and how many times this Board had sat since August, 1914.—Mr. MACPHERSON answered: There are 11 members, seven military and four civilian. The civilian members are paid £200 a year each for their services on the Board. Two military members receive extra pay of £150 a year and five receive nothing for this duty. The number of meetings of the board was in 1913 ten and in 1914 seven. No formal meetings have been held since August, 1914, but all the paid members have been constantly consulted and have given very valuable advice through the war.

Mr. PRINGLE: Is it not advisable to have the opinions of these men in concert as a council as they were intended to be?—Mr. MACPHERSON: I am informed that most of these members are serving in various theatres of war.

Sir GARROD THOMAS asked whether the honourable gentleman was aware that, although the number of civilian doctors now in the Army Medical Service outnumbered members of the regular Royal Army Medical Corps by more than ten to one, the civil doctors held none of the higher administrative posts which would give them power to introduce reforms or otherwise increase the efficiency of the Army Medical Service; and whether he would consider the desirability of taking action in this direction.—Mr. MACPHERSON replied: At the present moment there are a large number of consultant medical men of the highest attainments employed both at home and abroad with the Army, and these distinguished men are in constant touch with the Army medical authorities with a view to introducing reforms and increasing the efficiency of the Army Medical Service in such ways as experience may prove beneficial. Territorial and Reserve medical officers and civilians who have been granted commissions in the Royal Army Medical Corps during the war hold a fair share of the administrative posts in the Army. Throughout the war the line that has been invariably taken is that the best man should be employed where his abilities had the most scope, but it must be remembered however eminent a civilian medical man's attainments may be, he would be out of place in certain high administrative posts in the Army through his want of knowledge of the administration and organisation of the Army as a whole. Where this experience has been gained through service during the war these officers are equally available with Regular medical officers to posts of responsibility. The whole subject has recently been under investigation by a Committee, the report of which may be shortly expected.

Sir GARROD THOMAS asked whether the honourable gentleman was aware that owing to the uneconomical use of medical men by the Army Medical Service a number of hospitals in this country were under-staffed; that the supply of medical men to the civilian population was such that they could not hope to cope with a serious epidemic; that owing to this shortage a number of resident posts in hospitals had been filled by unqualified medical students, Chinese, Indian, and other coloured doctors; and that in many instances His Majesty's soldiers and their relations, including women during childbirth, depended largely on these for medical assistance; and whether he proposed to take any action in the matter.—Mr. MACPHERSON said in reply: I would refer my honourable friend to answers which I have already given on this subject. There is a committee in existence to safeguard the needs of the civilian population so far as medical men are concerned. I may add that the Secretary of State is contemplating the appointment of a small committee to consider the use which is being made of medical men in France.

Medical Equipment and Indian Troops.

Mr. MONTAGU (Secretary for India) informed Mr. KING that the future scale of medical equipment for Indian troops was under the consideration of the Indian Government.

Declarations under the Vaccination Act.

Answering Mr. SNOWDEN, Mr. HAYES FISHER (President of the Local Government Board) stated that the figures in regard to vaccination for 1915 were as follows: declarations of conscientious objectors, 293,315; births, 814,527; primary vaccinations, 375,330. The information for 1916 was not yet available.

In reply to Mr. WILKIE, Mr. MUNRO (Secretary for Scotland) stated that the following were the figures in regard to vaccination in Scotland:—

	1914.	1915.
Declarations of conscientious objection to vaccination	38,673	35,231
Births registered	123,934	114,181
Children vaccinated	63,433	61,456

Housing in Scotland.

Mr. MUNRO informed Mr. DUNCAN MILLAR that the report of the Scottish Housing Commission was expected to be finished by the end of this month.

In Committee of Supply on the note for the Local Government Board for Scotland, Mr. DUNCAN MILLAR drew attention to the need for further housing accommodation in Scotland.

In the West of Scotland, particularly in the middle ward of Lanarkshire, the conditions of housing were very serious indeed, and, in fact, at present they constituted a serious menace to public health.

Mr. T. B. MORISON (Solicitor-General for Scotland) replied that it was impossible to go into the details of housing policy for Scotland until the report of the Housing Commission had been received and considered. That report, he understood, would deal not merely with city problems but also with problems which specially bore on certain country districts, as well as upon those engaged in the fishing industry. It would further deal with the compulsory acquisition of land by local or other authorities. The most valuable portions of the report would be the recommendation of the provision of funds for carrying out a scheme of that kind, a proportion of the cost to be borne by the State and a proportion to be borne by the local authorities. In the meantime the Government had not been idle in regard to making preparations for dealing with the housing question in its general aspect. Deputations had been received by the Secretary for Scotland, and the matter had been before the Cabinet, who had come to the decision that it was necessary to afford substantial financial assistance from the public funds to local authorities who were prepared to provide houses for the working classes and for those engaged in work connected with the war. He thought a circular[1] had just been issued by the Local Government Board for Scotland from Edinburgh to the local authorities, in which they were asked what their requirements were and the amounts necessary for their various districts, and the Local Government Board hoped that by Oct. 15th they would be in possession of all the facts which were material to this matter.

THURSDAY, AUGUST 9TH.

Neurasthenic Cases in the Services.

Answering Mr. KING, Mr. BARNES (Minister of Pensions) said: There are 50 members of the Special Medical Board dealing with neurasthenic cases. The board sits at Lancaster Gate daily and at numerous centres in the provinces once in three weeks, or more frequently if necessary. The fact of a man's discharge has been approved by the board is an absolute exemption under the Review of Exceptions Act. The board have, of course, the power to refuse discharge, but that power is exercised sparingly. They have refused 50 cases out of 5000. They have no power to compel a man to re-enter the Army who has been discharged, and they are always glad to have, and frequently apply for, the opinion of medical men acquainted with the patient's previous history.

MONDAY, AUGUST 13TH.

Medical Examinations in the Army.

Mr. HOGGE asked the Prime Minister whether he had observed in the Report of the Select Committee on the Military Service (Review of Exceptions) Act that, in spite of the Army Council instruction issued by him when he was Secretary for War, secret instructions were issued by officials under his control which destroyed the value of his own instructions; and whether he intended to take any disciplinary action.—Mr. MACPHERSON (Under Secretary for War), who replied, said: My noble friend the Secretary of State for War declines to accept the description of this incident in the terms of my honourable friend's question, and is not prepared to regard it as calling for any disciplinary action. As a matter of fact, the letter referred to was issued by Sir Alfred Keogh under proper superior authority. It was intended to deal with what all those responsible agreed was a real danger. Whether as the result of the issue of the Army Council instruction of Sept. 7th or not wholesale rejections, especially in certain parts of the country, were taking place of men who were useful for Army service, though admittedly not up to the standard required in combatant units. It was, therefore, necessary to point out to the officials responsible for such rejections that Army service comprises a great variety of occupations answering roughly to those found in civil life, and that men capable of performing such service in the Army must not be rejected. This was regarded as a perfectly legitimate corrective to administer to those by whom the mistake was being made, and it was quite properly addressed to them direct by their immediate official superior. The recipients of the letter already had the Council instruction, and obviously the two were to be read together. The letter was marked "confidential," and not "secret," and if anyone takes the trouble to read the rules in paragraphs 1857–1864 of the King's Regulations dealing with the military distinction between these terms he will realise that no official would have marked as "confidential" a letter intended by him to secure what I gather my honourable friend alleges to be the sinister purpose of securing by a subterfuge a modification of the declared policy of superior authority.

[1] This circular is identical in substance with the circular sent out by the Local Government Board for England and Wales, on which we commented in a leading article last week.

TUESDAY, AUGUST 14TH.

Army Medical Service.

On report of the note of £1000 for Army Medical Service, Mr. PETO raised the question of "manipulative surgery." He asked that there should be no further delay in giving injured soldiers the benefit of the treatment offered by Mr. Barker and others who had proved that they could treat injuries to the joints successfully. He alluded to the opposition of medical men to "manipulative surgery" and to the refusal of Sir Rickman Godlee and Sir F. Taylor to give evidence to an informal committee which was investigating the subject. It was because of the opposition of the medical profession that the War Office would not give an opportunity to "manipulative surgery."

Sir JOHN SIMON said that he was one of the informal committee, which looked into the question from a legal point of view and not from that of medicine or surgery. If the Army Council saw fit in any given case to authorise the soldier to consult one of these unqualified medical advisers—it might or might not be wise from a medical standpoint—it was a perfectly legal thing to do.

Sir W. WATSON CHEYNE, in a maiden speech, said that he felt he could speak freely on this subject because he had made up his mind that from the time he took his seat in the House he should give up private practice, but he had asked that he should be allowed to continue his work in a naval hospital. If they made an exception in regard to this individual gentleman honourable Members had to remember that there were a great many bonesetters in London, and he did not think that they could be kept out. However excellent Mr. Barker might be, the granting of facilities to these others would have the result of flooding the Army Medical Service with a set of irregular practitioners who were absolutely incompetent. Where were they to stop? Let him say a few words about bonesetters generally. The average bonesetter did not know even the names of the bones. He had only one diagnosis and one method of treatment, and that was to wrench and twist the limb. The human frame was a very delicate organism. It should not be meddled with by people who did not know it as thoroughly as they ought to know it. There was no doubt that in many cases bonesetters had given relief and for some time it was puzzling to know how this was brought about. The honourable gentleman proceeded to deal with surgical questions involved in the treatment of injuries to the joints. A good surgeon would treat these much more safely than a bonesetter could do. He had known a case where a bonesetter had broken a malignant tumour, with a tragic sequel for the patient. He was afraid that he was giving a surgical lecture. Matters like this deserved very careful consideration, and the House must not be led by the success of one man in a small department of surgery to upset a whole organisation.

Sir GARROD THOMAS, in a maiden speech, called attention to medical arrangements generally in connexion with the Army. He agreed with what had been done in regard to the supply of doctors in Mesopotamia, Egypt, and Salonika. In France, however, which was near at hand, it was a great waste to keep medical men there who were employed only two or three hours a day or who were employed on work which others than medical men could do. He cited several cases of this wastage of valuable material in France. There was also shocking waste in employing specialists in surgery in some other department or even in sanitary work. There was enough material to go round both for the Army and the civil population if it was properly used. But as things were, owing to bad Government organisation, he knew of a case where only one doctor was left to look after a population of 11,000. He suggested that the Government should institute an inquiry to determine the relative needs of the Army and the civil population for doctors.

After further discussion Mr. MACPHERSON (Under Secretary for War) said that his department had done everything possible to meet the civilian need for doctors. There was a Central Medical War Committee, composed of representatives of the Local Government Board, the National Insurance Department, and the War Office, which considered the claims of the military and civil populations. That Committee had done its work very well. But the War Office must have first consideration for the treatment of the soldiers at the front. It was a regrettable fact that there were cases where there was difficulty in getting doctors to meet the civilian needs, but many regrettable facts had to be admitted. Even assuming, however, that there had been a waste of medical men at the front, the Secretary for War had stated that he would send a committee of distinguished men to France to inquire into the matter. He hoped to be able to announce the names of the committee in a few days. It must be remembered, however, that even if doctors were partially idle at the front it was most necessary to provide all medical men necessary for times when there was a large number of casualties. In regard to the charge that the Army Council refused to

utilise the services of a distinguished man because he was not a qualified practitioner he said that the inefficient treatment of the soldier was a thing which would make the Government quake. There were two bodies to be considered. The first was the Army Council. They must consider whether it would be right or wrong to ask any soldier to undergo treatment except by a man who had passed the statutory test. Then as to the other responsibility, he understood that there was no objection to a soldier on his own responsibility going, if he chose, to have treatment from an unqualified man. He did not think he could be asked in the public interest to make any concession.

The vote was then agreed to.

Medical News.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—The following scholarships have been awarded:—

Entrance Science Scholarships (1st, £150; 2nd, £60).—J. C. Churcher and N. S. Macpherson, being equal, divide the two scholarships.

Arts Scholarships (two).—W. H. Dunn and E. G. Housden (£15 15s.).

LONDON INTERCOLLEGIATE SCHOLARSHIPS' BOARD.—The following Medical Scholarships have been awarded:—University College: Bucknill Scholarship: A. J. Morland, Sidcot School, Somerset, and University of London, University College. First Medical Exhibition: C. D. Shapland, Streatham Hill College and University of London, University College. Second Medical Exhibition: V. Feldman, Central Foundation School and London Hospital Medical College. (The foregoing are subject to the confirmation of the College Committee.) King's College: Warneford Scholarships: M. Melglave, University of London, King's College; and P. M. Acheson, Dulwich College, and N. W. Snell, Alleyn's School, Dulwich (equal). Westminster Hospital Medical School: Chemistry and Physics Scholarship: J. Pearce, Newport Grammar School, Shropshire. London (Royal Free Hospital) School of Medicine for Women: St. Dunstan's Exhibition: E. V. Adams, High School, Croydon. Isabel Thorne Scholarship: D. N. L. Leverkus, High School, Sydenham. Mabel Sharman-Crawford Scholarship: E. M. Store, London (Royal Free Hospital) School of Medicine for Women. Mrs. George M. Smith Scholarship: E. J. Williams, Ladies' College, Cheltenham.

POLIOMYELITIS IN ENGLAND AND WALES.—Only two cases of poliomyelitis were notified in London during July of this year compared with 18 cases in the corresponding month of 1916. In England and Wales the total number of cases notified last year was 689, the incidence rising sharply in the week ending July 22nd and again in the week ending August 19th. This year the number again rose sharply in the week ending July 21st, the actual number of notifications in the June weeks being 1, 4, 7, 7, 5; in the July weeks 4, 3, 15, 6; and in the first August week 9.

Brevet-Colonel J. Paul Bush, C.M.G., R.A.M.C., has been appointed a Deputy Lieutenant for Gloucestershire.

THE King has conferred Knighthoods upon Surgeon-General Eugène Fiset, C.M.G., D.S.O., Canadian Militia, Deputy Minister of Militia and Defence of the Dominion of Canada, and upon Dr. Edward C. Stirling, C.M.G., professor of physiology in the University of Adelaide.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

PINKER, H. G., L.R.C.P., M.R.C.S., has been appointed Deputy Honorary Medical Officer at the Pearn Convalescent Home, near Plymouth.

THOMAS, R. S., M.D., B.C.Cantab., and THORNTON, G. L., M.R.C.P. Lond., M.R.C.S., have been re-appointed Honorary Medical Officers to the Exmouth (Devon) Cottage Hospital.

WIGHAM, W. H., M.D. Durh., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Tattenhall District of the county of Chester.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

AYRSHIRE, LOWER DISTRICT OF COLMONELL PARISH.—Medical Officer. Salary £70 per annum.

BARNSLEY AND WAKEFIELD JOINT SANATORIUM COMMITTEE.—Assistant Tuberculosis Officer. Salary £300 per annum, with board, &c.

BARNSLEY, BECKETT HOSPITAL.—Two Female House Surgeons. Salary as arranged, with board, &c.

BEDFORD COUNTY HOSPITAL.—House Physician, unmarried. Salary £150 per annum, with board, &c.

BRIGHTON COUNTY BOROUGH.—Assistant Medical Officer. Salary £350 per annum.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—House Physician. Salary £150 per annum, with board, &c.

CHELTENHAM EYE, EAR, AND THROAT FREE HOSPITAL.—Honorary Surgeon.

EASTBOURNE EYE INFIRMARY.—Ophthalmic Surgeon.

GREAT YARMOUTH GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £200 per annum, with board, &c.

KING EDWARD INSTITUTION, Albert-street, Spitalfields, E.—Medical Officer for Maternity and Infant Welfare Centre for one Weekly Clinic. Salary 1 guinea.

LEICESTER ROYAL INFIRMARY.—House Surgeon. Salary £250 per annum, with board, &c

LINDSEY (LINCOLNSHIRE), COUNTY OF THE PARTS OF.—Female Assistant Medical Officer of Health. Salary £400 per annum, with travelling expenses.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Female House Surgeon.

MAIDSTONE, WEST KENT GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £250 per annum, with board, &c. Also Assistant House Surgeon. Salary £125 per annum, with board, &c.

MANCHESTER UNION, NEILL LANE MILITARY HOSPITAL, West Didsbury.—Locum Assistant Resident Medical Officer. Salary £7 7s. per week, with board, &c.

NORTH-EASTERN HOSPITAL, St. Ann's-road, Tottenham, N.—Female Assistant Medical Officers. Salary 7 guineas per week.

ROCHESTER, ST BARTHOLOMEW'S HOSPITAL.—Junior Resident House Surgeon. Salary at rate of £150 per annum, with board, &c.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.—House Surgeon. Salary as arranged, with board, &c.

SALISBURY GENERAL INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN, GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS.—Senior Female House Surgeon, unmarried. Salary £300 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—Two House Surgeons. Salary £120 per annum, with board, &c.

SWANSEA EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £350 per annum.

WALSALL EDUCATION COMMITTEE.—Temporary School Medical Inspector. Salary at rate of £400 per annum.

WHITCHURCH, NEAR CARDIFF, WELSH METROPOLITAN WAR HOSPITAL.—Resident Physicians.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

Births, Marriages, and Deaths.

BIRTHS.

BARBER.—On August 10th, at Temple-gardens, Golder's Green, the wife of Surgeon C. P. Barber, R.N., of a son.

FREW.—On August 10th, at Portland-court, W., the wife of Dr. Robert Frew, of a son.

GRAHAM-JONES.—On August 12th, at Nottingham-place, W., the wife of T. L. Graham-Jones, Captain, R.A.M.C., of a daughter.

HARTIGAN.—On August 12th, at Gloucester-terrace, W., the wife of Thomas Hartigan, M.D., of a son.

JEWESBURY.—On August 6th, at Wimpole-street, W., the wife of Reginald C. Jewesbury, M.D., F.R.C.P., of a son.

PLATT.—On August 7th, at Daisy Bank-road, Victoria Park, Manchester, the wife of Harry Platt, M.S., F.R.C.S., Captain, R.A.M.C.(T.), of a daughter.

PRATT.—On August 8th, at Hainault Lodge, Chigwell, Essex, the wife of John Henry Pratt, M.B., Temporary Lieutenant, R.A.M.C., of a son.

PURSER.—On August 7th, at Lower Baggot-street, Dublin, the wife of Dr. J. J. Purser, of a daughter.

TRAVERS.—On August 8th, at Phillimore-gardens, W., the wife of Ernest Travers, M.D. Lond., of a son.

MARRIAGES.

BROWN—KEMPSON.—On August 6th, at Farnham Parish Church, William Welch Brown, R.A.M.C., to Katharine Esther Lois, daughter of Edgar Kempson, Loadhams, Farnham.

SCOTT—SCHREINER.—On August 3rd, at Holy Trinity Church, Sloane-street, Captain Ralph Lester Scott, R.A.M.C., to Ursula Hester, younger daughter of the Right Hon. W. P. Schreiner, of South Africa.

DEATHS.

CLARKE.—On August 11th, at Bexhill-on-Sea, Lieutenant-Colonel A. F. S. Clarke, R.A.M.C. (retired), aged 78.

HORSEY.—On August 9th, killed in action, Arthur Mather Horsey, Surgeon-Probationer, R.N.V.R.

RENDLE.—On August 7th, at Russell-road, W., C. Bainbridge Rendle, M.R.C.S., L.R.C.P., aged 81.

SCOBIE.—On August 3rd, died of wounds, Lieutenant James Scobie, L.D.S. R.C.S. Edin., Gordon Highlanders, aged 36.

TOULMIN.—On August 2nd, killed on one of H.M. ships, Surgeon Stewart Newnham Toulmin, R.N.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

STUDENTS' NUMBER OF THE LANCET.

INFORMATION intended for the Students' Number of THE LANCET must be sent WITHOUT DELAY, addressed to the Sub-Editor, and marked on the envelope "Students' Number Only."

"THE CAUSATION OF SEX."

To the Editor of THE LANCET.

SIR,—In the book by Mr. E. R. Dawson, reviewed in your columns on July 7th, there is no mention of the interesting work of R. Robinson,[1] who found that adrenalised guinea-pigs gave birth to a preponderance of males, and cholinised animals to a preponderance of females. He concluded that the sex of mammals is determined by the degree of activity of the mother's adrenals, hypoadrenalism giving female births, and hyperadrenalism male births. He found that by a study of the reaction of Fränkel-Allers (acid iodate of potassium) one can detect the presence of minimal quantities of adrenalin in the urine or blood of guinea-pigs. By this test, applied to the urine of four pregnant women, he was able to forecast correctly the sex of their coming offspring. If the woman's urine gives the reaction of adrenalin, she will have a son; if not, a daughter. In 1914 Bram took up the subject in 30 of his patients who wished to have a son.[2] The treatment which he adopted successfully was "the outcome of a combination and modification of the following two most plausible theories" of sex-determination:—(1) that of Weill,[3] that sex depends on a contest between spermatozoon and ovum: if the former be predominantly active, the outcome is a male, and *vice-versa*; and (2) Robinson's theory. Bram began treatment directly the period was missed, kept it up till the fourth or fifth month, and then stopped it. If a boy was wanted, the patient was put on cereals, fruits, potatoes, milk, butter-milk, and butter, and plenty of water to drink. She was forbidden eggs, meat, fish, cheese. After each meal a capsule was given containing 2 grs. of adrenal extract and 4 grs. of lecithin; Bram believes that lecithin stimulates insufficient adrenals, and possibly also normal ones.

Although there is room for much exact experimental study of this subject, yet there is something to say for Robinson's theory; for any satisfactory theory of sex-determination must apply even far down in invertebrata. We know by the work of Dr. J. F. Gaskell[4] that the chromaffin system of the leech has a very marked action on its contractile vascular system. But at the same time it seems unlikely that sex depends solely on the state of the mother's adrenals during pregnancy. And we are still in the dark whether sex is determined soon after spermatozoon and ovum come to grips, or at a later period.

I am, Sir, yours faithfully,

London, N.W., August 4th, 1917. LEONARD J. KIDD.

PLAGUE IN EGYPT DURING 1916.

THE Department of Public Health of the Ministry of the Interior, Egypt, has issued through the Government Press, Cairo, a statistical summary of the cases of plague occurring in Egypt during the year 1916 and a comparison with the two previous years. In 1914, 181 cases were admitted to hospital; in 1915, 188 cases; and in 1916, 1361 cases. The increased incidence began in December, 1915, and was at its maximum in April, 1916, while by August, the normal morbidity was reached again. The percentage of deaths in hospital to admissions was 35·8 in 1916, against 38·8 in 1915 and 40·3 in 1914.

HELPS TO FOOD ECONOMY.

THE National Food Economy League, 3, Woodstock-street, Oxford-street, London, W., which is conducting an educational campaign throughout the country for the prevention of waste of the national food resources, has issued, at the price of 6*d.*, a useful little pamphlet giving war-time receipts for households where servants are employed. Over 100 examples are given, many of them being what may be called "type receipts"—that is, those which are applicable at discretion to other materials than those mentioned. As the book is intended for those who are able to afford the more expensive kinds of foods, receipts are included which are economical in the sense that they save food rather than money. For while the strictest economy of consumption should be exercised in all cases, everybody who can afford it should eat the more expensive kinds of food so as to leave the cheaper kinds for the poor. Bread can be saved not only by using a smaller quantity but also by using substitutes. This is a valuable cookery-book in miniature, dealing with soups, stocks, fish, meat, savouries, vegetables, sweets, sauces, and salads, with hints on breads and cakes which are of practical use at a time when there is urgent need of conserving our wheat-supply.

HONEY.

A LITTLE pamphlet on bees and honey by Mrs. Grieve, of Chalfont St. Peter, Bucks, gives the views of an expert, which will prove of interest not only to bee-keepers but to all gardeners and allotment-holders. Notes on the natural history of bees are given, together with information as to the quality and quantity of honey that may be expected from bees feeding on particular flowers. Honey as a food is discussed, with recipes for cake, bread, and sweets made from it.

THE EMPLOYMENT OF WOMEN IN WAR TIME.

THERE is no lack of employment for capable women at the present time. Those who possess a training in one of many directions or are willing to undergo training can find immediate occupation if they know where to turn, and to provide them with such information a useful book has been published entitled "Women's Work in War Time,"[1] enumerating the various posts open to women along with the qualifications required, the hours of work, remuneration offered, and so on. Among the occupations appealing to women of education are those of doctors, factory inspectors, health visitors, infant protection visitors under the London County Council, inspectors under the Local Government Board, crèche matrons, dental mechanics, masseuses, midwives, nurses, organisers of care committees, pharmacists, sanitary inspectors, welfare superintendents, clerks, and secretaries. A supplement contains a series of chapters from different pens describing in more detail the vocations enumerated in the first part.

[1] Women's Work in War Time: A Handbook of Employments compiled and edited by H. M. Usborne, with a Preface by Lord Northcliffe. London: T. Werner Laurie, Ltd. 1917. Price 2*s.* net.

[1] Compt. Rend. de l'Acad. des Sci., (a) 1911, clii., p. 1026, and (b) 1912, cliv., p. 1634.
[2] New York Med. Journ., 1914, xcix., p. 1140.
[3] Monatsch. f. Gebürts. u. Gynäk., xxxvi., December, 1912.
[4] Phil. Trans. Roy. Soc., 1914, B. ccv.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 15th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Aug. 9	0·10	114	71	56	58	61	Cloudy
,, 10	0·06	115	74	58	59	62	Cloudy
,, 11	0·01	118	71	61	60	64	Cloudy
,, 12	0·01	119	73	58	62	65	Cloudy
,, 13	0·02	120	73	59	60	63	Cloudy
,, 14	0·01	119	72	59	60	64	Cloudy
,, 15	0·27	117	71	59	59	62	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

The following journals, magazines, &c. have been received:—Revue de Chirurgie, Journal of Laryngology, Rhinology, and Otology, Clinical Medicine, Canadian Medical Association Journal, British Journal of Dermatology and Syphilis, Archives de Médecine et Pharmacie Navales, Revue de Médecine, Annales de l'Institut Pasteur, American Journal of Roentgenology.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Offices: 423, STRAND, LONDON W.C. 2.

MANAGER'S NOTICES.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1917 are now ready. Bound in cloth, gilt lettered, price 21*s.*, carriage extra.

Cases for binding the half-year's numbers (inland edition) are also ready. Cloth, gilt lettered, price 2*s.* 6*d.*, by post 2*s.* 10*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 49.

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